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VETERINARY JOURNAL

Editor:
FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E.,
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING,
OFFICIER DU MÉRITE AGRICOLE (FRANCE),
CAVALIERE DEI SS. MAURIZIO E LAZZARO (ITALY),
HONORARY MEMBER OF THE AMERICAN VETERINARY ASSOCIATION,
PRINCIPAL OF THE ROYAL VETERINARY COLLEGE, LONDON.

Sub-Editor:
GLADSTONE MAYALL, M.R.C.V.S.

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Biography

Professor J. BASIL BUXTON, M.A., F.R.C.V.S., D.V.H.

In electing Professor Buxton, as President of the Royal College of Veterinary Surgeons, to rule the destinies of the profession during the forthcoming twelve months, the Council was unanimous in its appreciation of what he has done in the past to help to put the profession on its present level. Since graduating from the London College in 1909, there has scarcely been any forward movement connected with the profession during the past twenty years in which Professor Buxton has not been in some capacity or other occupying a prominent part. His election a short time ago to the Presidency of the National Veterinary Medical Association was a very popular one, and if what was done during his term of office to further the work of the Association can be taken as any criterion of what will be done during the coming presidential year, the profession may rest assured that the man at the helm is the right man in the right place. As an organiser he has few equals, and when he puts his hand to the plough the furrow is as a rule completed. There are several matters of vital importance before the profession at the present moment: the five-year examination syllabus, and the endeavour to stem the unqualified tide of quackery being especially urgent, and for each of these Professor Buxton has been an ardent worker. Let us hope that his year of office will see as successful a sequel to the latter as has already been brought to the former.

Mr. P. J. L. KELLAND, M.R.C.V.S.

The Ministry of Agriculture and Fisheries has appointed Mr. P. J. L. Kelland, M.R.C.V.S., the deputy chief veterinary officer, to be the Chief Veterinary Officer of the Ministry in succession to Sir Ralph Jackson, who has retired owing to reaching the age limit. The choice is one which will be very popular not only with the members of the staff of the Veterinary Department of the Ministry of Agriculture and Fisheries, but also with the veterinary profession as a body. It is largely due to the energetic efforts of Mr. Kelland that so much has been done from the legal side to put the transport of horses by sea and land on a humane and practical footing, and it has been principally owing to his energy and tact that the decrepit horse traffic has become a thing of the past. The laws of the Ministry of Agriculture and Fisheries which control these two methods of horse transport are the most up-to-date in the world,

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and it is not too much to assert that there is not a ship which carries horses away from England to other countries, the fitting up of which has not at some time or other had Mr. Kelland's personal supervision. For this humane service alone the animal world owes him a very deep debt of gratitude, as it involved travelling at all hours of the day and night (often under uncomfortable conditions); as when Mr. Kelland took the matter up the condition of the horses sent across to the Continent was in many thousands of cases absolutely deplorable—in fact a disgrace to England—and the change to the present condition of the animals exported for the foreign abattoirs was only effected in the face of much (and even dangerous) opposition. The position of Chief Veterinary Officer is one of tremendous responsibility, and the Government has acted wisely in selecting, in Mr. Kelland, a man who has not only passed through every stage of the Department, but has filled each position to which he has been appointed with credit and distinction.

Editorial

THE N.V.M.A. JUBILEE CONGRESS.

FORESIGHT guided those whose duty it was to select a meeting place for the Jubilee Congress when they decided on Folkestone. The "grand" assembly of members and their friends must have fully justified their expectations of a "record" attendance. We have been to many congresses in the past, but we feel that it is no exaggeration to state that the Folkestone congress appeared to surpass many in general excellence of fare. Those responsible for the various arrangements are to be congratulated on their efforts, the results of which bore the hall-mark of conditions approaching perfection. It would be difficult to single out individual items for special mention, but we cannot let this occasion pass without referring to a few. The variety of the subjects dealt with at the sectional meetings, and the animated manner in which members joined in the discussions, impressed one considerably, and on more than one occasion the session had to be extended to allow a few more members to express their opinions. It may be that the programme of papers for discussion was too ambitious, but it seems to show how the profession is attempting to deal with the multitude of problems it has to face, and how keen and eager are those qualified to speak on these subjects. An outstanding success was the arrangements made for the convenience of those demonstrating operative technique. A special room was set aside for the purpose, and in it was erected a temporary platform with seating accommodation for about 150 people; everyone had a splendid view of the operators, who were thus unhampered in their work, and whose skill was the subject of much comment and appreciation. The responsible committee very wisely arranged a demonstration of the application and interpretation of results of the intradermic tuberculin test in cattle, and though perhaps all present did not see eye to eye in the interpretation of the reaction in one animal, the demonstration undoubtedly cleared up some of the points which worry practitioners.

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No congress is complete without its exhibition of instruments, drugs, books, etc. Twelve firms, many of them old in the history of veterinary medicine, displayed their various products in a manner pleasing to the eye; the increase in the number and variety of biological products (vaccines, serums, gland extracts, etc.) displayed is indicative of the trend of methods of treatment.

Socially, members were also well catered for. It is true that the excursions which often form one of the attractions at congresses were reduced to one (a trip to Canterbury, with a tour of the Cathedral); doubtless the committee felt that visitors to Folkestone could find ample entertainment within the town and in its vicinity. The Annual Banquet and the President's Reception will long remain pleasant memories of evenings enjoyably spent. The simplicity of these functions was their feature; the few speeches, the musical entertainment, the cheerfulness and amiability of all present, and the dancing on both occasions, ensured their undisputed success.

Held in conjunction with the Congress were two important items: the popular lecture on "What the Veterinary Profession is doing for your Animals," ably delivered by Sir John Moore, and illustrated by films and slides explained by Principal Hobday; and the dance organised by Mrs. G. H. Wooldridge and her friends in aid of the Victoria Veterinary Benevolent Fund. Both were well attended, and we would add out congratulations to those which the organisers have already had in abundance, and which are richly deserved. The V.V.B.F. also benefited from the proceeds of the Golf Competition, the final round of which was played during the week, and for which the presentation of the Simpson trophy, etc., to the successful competitors was made at the dance. The fact that we never forget our less fortunate brothers and their dependants is one of the features which always stands out at our various gatherings.

Lastly, the business meetings deserve special mention. The President was supported on all occasions by "robed" members on the platform, and it is a fitting reward for his work in connection with the "National" that he has been elected President for the third year in succession.

Congresses such as this must leave their mark, and must serve as an education to the general public of the work which the veterinary profession is doing throughout the country. The mere fact that the Mayor of Folkestone saw fit to grace the various social functions, to make speeches on several occasions, to attend the public meetings, and to be present at more than one sectional meeting, speaks for itself. The Folkestone Congress has certainly set a high standard.

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General Articles

A NOTE ON THE ANCESTOR OF THE MODERN DOMESTIC HEN.

By W. P. BLOUNT, F.R.C.V.S.

Goring, Oxon.

IT is generally recognised that the modern domestic hen is a direct descendant of the jungle fowl, and it is therefore of great interest to compare the two types of birds. The opportunity to do so, however, is unusually rare, and the writer is greatly indebted to Sir Guy Hambling, Bart., and his friend, Mr. Erroll Daniell, for arranging the despatch of four jungle fowls (two hens and two cocks) direct from their natural environment in Ceylon. In order to ensure that the birds would arrive in reasonably good condition special precautions were taken. Four hundredweight of ice were procured and carried into the jungle, the birds were shot, packed on the spot, and rapidly transported to the SS. "Otranto," where they were kept in cold store throughout their journey to England. On arrival the birds were landed by special permit to ensure that no delay would occur because of Customs or other officials, and the birds were examined immediately they reached the laboratory.

In general appearance the fowls greatly resembled pheasants, their feather markings being similar. The cocks possessed bright tinted plumage and large single combs, with their free extremities blunt-nosed, and placed above and behind their attachment to the crown of the head; the wattles of the male birds were also well developed. The average weight of the fowl was 1½ lb., the male birds averaging over half a pound more than the females. The following are the *post-mortem* notes as obtained at each examination:

(1) *Jungle Hen.*—Weight 1 lb. Breast muscles well developed. *Crop*—half full of medium-sized berries (over 100), and a quantity of biting insects, ant-like in appearance. The berries were dark-blue (not unlike elderberries), each containing a large central "stone." The insects floated on water, and were seen to possess three powerful legs, two pairs of antennæ, and strong pointed, biting, mahogany-coloured jaws. *Gizzard*—contained little food in the ordinary sense of the word. There were a few small distorted insects, one large wasp-like creature, six pieces of insoluble grit, nine large brick-coloured "stones" from berries, eighty smaller, drab-coloured "stones" (from berries similar to those found in the crop), and some sand. *Duodenal Contents*—emulsified; no parasites present. *Cæcal Contents*—paste-like in consistence, blackish-tinted and containing some coccidia; at least two varieties were present. The parasites were insufficient to suggest that coccidiosis was present. The black pigmentation

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of the contents was presumably derived from the berries. *Spleen*—large. *Thymus*—large and lobulated, extending from the neck into the chest almost as far as the thyroid gland. The presence of a thymus gland suggests, if it can be assumed that the bird was healthy, that it was not yet mature, *i.e.*, a young pullet. *Ovary*—inactive. *Bursa of Fabricus*—large.

(2) *Jungle Cock.*—Weight 1¾ lb. *Crop*—empty. *Gizzard*—contained only twenty-four large brick-red " stones " from berries, and two pieces of lead shot. *Liver*—ruptured, due to lead shot penetrating through the breas muscles, which were hæmorrhagic.

(3) *Jungle Hen.*—Weight 1 lb. 5 oz. *Crop*—empty. *Gizzard*—contained a variety of berry " stones " : two large brick-red as above ; five resembling Dari grain, but in reality consisting of a hard wall and softer small centre ; five larger crinkled, dark-brown " stones " ; no " food " was present. *Cæcal contents*—contained several coccidia : a small type resembling that present in cases of duodenal coccidiosis in pullets, and a larger elongated species somewhat like that affecting rabbits, but with the central granular mass almost completely filling the oocystic envelope. *Ovary*—active on the left side of the body. *Oviduct*—showed evidence of chronic inflammation ; it was ruptured in region of the shell membrane forming portion, *i.e.*, the isthmus. *Abdominal cavity*—contained pale degenerate slimy pus, and also a ruptured shell-less egg ; the mesentery was inflamed. *Spleen*—enlarged and degenerate.

(4) *Jungle Cock.*—Weight 2 lb. *Crop*—empty. *Gizzard*—contained parts of many insects, and a quantity of fibrous outer husks of some variety of corn or berry " stones." There were present also one large berry " stone," five brick-red " stones," six pieces of flint-quartz grit, and many smaller pieces of glass-like sand quartz. *Cæcal contents*—no coccidia or other protozoa : a few small round worms which, to the naked eye, were indistinguishable from ordinary cæcal worms, *i.e.*, *Heterakis papillosa*.

General Remarks.

It is clear from this study of four jungle fowls (killed and obtained direct from their natural habitat) that several important facts have been gained concerning nutrition and parasitology which probably have a bearing on the life of the modern domestic hen. It would appear that berries and insects are the chief foods obtained by this species of birds, which not only confirms the omnivorous nature of their diet, but also shows how jungle fowl, probably because of their superior powers of flight, differ from the domestic fowl in their ability to obtain quantities of berries.

Structurally, domestic hens present few if any variations from their ancestors the jungle fowl, and to the naked eye the gizzards of each are similar, both anatomically and physiologically. It is therefore interesting to note that in addition to containing insoluble grit, the gizzards of jungle fowl carry hard

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" stones," which represent the remains of various types of berries. These " stones " will augment the mill-like grinding action of insoluble grit, and may be presumed even to replace the latter, should natural grit be scarce. Modern hens, however, with their diminished powers of flight and unnatural confinement, are seldom able to obtain berries, and consequently need an adequate supply of false teeth (insoluble grit), more especially if housed on calcareous (chalk) or heavy (clay) soils, where natural grit is frequently absent and generally sparse.

Some poultry keepers believe that intestinal parasites are always a sign of disease, no matter how few are present. It is known, however, that most parasites are perfectly normal possessions, in that a harmony exists between the host (hen) and her parasites, both external (lice) and intestinal (coccidia, worms, etc.), whereby both are allowed to live satisfactorily. To find several varieties of coccidia and some cæcal worms in natural jungle fowl is surely sufficient evidence that these parasites are not related to " domestication " ; but it would not appear unreasonable to presume that if the harmony which exists between host and parasite is disturbed then disease may result. It is known that on many occasions this harmony is broken because of faults in feeding, brooding, and rearing domestic chicks. Under natural circumstances two factors are associated with the prevention of parasitic diseases, thus :

(1) *The quantity of parasite's eggs which are ingested.*—It is probable that because birds are able to fly freely and invade large areas of ground, only a few eggs will be swallowed at one time, and it may be some considerable time afterwards before more are encountered.

(2) *Natural Resistance.*—Either because of the physico-chemical resistance of the cells of the intestines, or because of a state of immunity which follows the action of a few parasites, birds develop a natural resistance to parasitic infestations.

With domestication both these factors often become abnormal. Thus, where birds are housed on a limited area of ground, massive doses of parasites are ingested, and reinfestations are liable to occur frequently. Also, because of battery brooding and other intensive methods of rearing, chicks nowadays do not receive small doses of parasites with which to become immune, but on being placed out of doors at the age of four to ten weeks, often encounter large quantities of parasites, and thus disease follows. It is also known that errors of nutrition cause a lowered intestinal resistance, and one of these errors is to fail to supply an adequate quantity of insoluble grit from birth onwards for grinding purposes. Another concerns the presence of an imbalance of vitamins in the diet.

Finally, it is interesting and instructive to learn that rupture of the oviduct is not necessarily related to forced egg production. It is probably reasonable to assume that the jungle hen in question was exhibiting normal, seasonal, ovarian activity, and that the ruptured oviduct was due either to faulty structure of the organ, or to some accidental factor which may be encountered during a physiological existence.

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Summary.

(1) Four native jungle fowls were examined *post mortem*, direct from their habitat in Ceylon. (2) The foodstuffs present in the crops and gizzards were (*a*) berries and (*b*) insects. (3) The gizzards contained insoluble grit, and also berry "stones" for mastication purposes. (4) Several varieties of coccidia were present in the cæcal contents, and also a few, small, round worms (*Heterakis ?*). (5) There were no naked-eye structural differences between the organs of the jungle fowl and those of the domestic hen, except as regards actual size, indicating that domestication has not induced any anatomical transformations. (6) Rupture of the oviduct need not be related to forced egg production.

A RARE MODE OF TRANSMISSION OF PULLORUM DISEASE.

By H. P. HAMILTON, B.V.Sc.(Toronto).

Poultry Pathological Research Laboratory, Goring.

RECENTLY we received for post-mortem examination the carcase of a cockerel with the history that he had been what the owner termed, "full of life" for some months. He had been in a breeding pen, and only a very small percentage of eggs had failed to hatch. A few days before the owner destroyed him the cockerel appeared to "go down" and a "liver pill" was administered, with the result that he passed a quantity of "green" fæces.

The cockerel had passed the blood agglutination test for pullorum disease on two occasions, the last seventeen days before death, and had been running with a pen of hens all of which had also passed the test. With the exception of a dozen, every chick (approximately 300) hatched from this pen died of pullorum disease. The twelve survivors were scattered among the various breeds and grew in the normal way. The housing conditions of the cockerel and hens were ideal, and various types of incubators, brooders, broody hens, fresh land and attendants had been tried.

On receipt, the weight of the carcase was 7 lb. 10 oz., *i.e.* about normal.

On opening the bird the liver was found to be very dark green in colour, the gall bladder was distended, and the small intestines in a catarrhal condition with some sloughing of the mucous membranes. There was an infestation of large round worms (*Ascaris inflexa*) in the small intestines. The right testicle appeared to be normal, but the left was misshapen and flabby. Cultures were planted from both testicles and *Salmonella pullorum* isolated in a state of purity from each.

In view of the fact that the hens running with the cockerel had all passed the agglutination test before being mated, it was decided to retest the blood from each hen. This retest was carried out, and in every case the result was again negative.

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The hens in question had previously produced healthy chicks by another cockerel. They then produced 300 chicks by the infected cockerel, all of which, with the exception of the dozen referred to above, died of pullorum disease.

After the cockerel was destroyed, three full sittings of his eggs were put under hens. Every egg hatched, and at the time of writing (three months later) not one chick has shown signs of illness. Curiously enough, every individual in these three broods is a cockerel.

From the facts set forth above, it would appear that the cockerel was able to transmit the infection through the egg without causing the hens' serum eventually to give a positive reaction to the agglutination test for pullorum disease, and it is difficult to understand the reason why the cockerel was unable to produce a healthy chick until he was in such a condition as to be described by the owner as " at the point of death."

Moreover, during the breeding season, spread over from mid-January to the end of April, hundreds of his eggs had been put down, and the owner has practically no survivors except the three broods produced when the cockerel was in a dying condition and after his death.

[This note is published as the circumstances appear very unusual and in the hope that it may provoke an explanation from some workers who have studied this problem.]

PROBLEMS IN CONTROLLING AND ERADICATING JOHNE'S DISEASE.*

By V. S. LARSON, B. A. BEACH and W. WISNICKY.

Madison, Wis., U.S.A.

JOHNE'S disease is a specific chronic enteritis of cattle caused by a member of the group of mycobacteria or acid-fasts, to which the tubercle bacillus also belongs. The causal organism grows in the mucous membrane of the intestines, and in the mesenteric lymph-nodes. It produces a diffuse thickening of the bowel wall which interferes with the absorption of necessary nutrients. The disease is marked by intermittent diarrhœa, and by emaciation.

Although primarily a disease of cattle, it is found also in sheep, horses, deer, and goats. Its importance in the sheep industry cannot be estimated because it has been confused with other diseases of sheep.

England, Holland, and Switzerland, three of the world's chief original sources of dairy cattle, have apparently harboured for a considerable time herds infected with Johne's disease. Countries importing cattle from these sources evidently

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import the disease with them, since outbreaks are never met in native herds, but only in those which include animals of imported breeds.

Twort and Ingram believe that records show its presence in England in the first half of the nineteenth century. It seems to have been present in Holland for many years. Marcus (1904) reports that Koorevaar, a Dutch veterinarian, had noted the thickening of the intestinal wall of emaciated cattle, and that in some districts the name "scheisser" was used as a probable synonym of "scourer."

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The importation of various breeds from the countries mentioned has given an opportunity for the introduction of Johne's disease into the United States. It has been reported from South Africa and from India as well, and is probably present in all regions to which the English, Dutch, Swiss, and Channel Islands breeds have been sent. Our federal quarantine authorities have never considered it directly. Due to the lack of practical means for detecting it, other than by clinical symptoms, it is not probable that much could have been done to prevent the entrance of incipient cases. A prominent importer of cattle from the Channel Islands has stated that animals have died in our quarantine stations from what was apparently Johne's disease.

It is obvious that it is as important to prevent the importation of animals affected with Johne's disease as it is to prevent the entrance of tuberculous cattle. Since a diagnostic agent is now available, cattle should be tested at the point of export in order to prevent the further introduction of the disease into this country. During the past year a bovine animal originating in Canada was imported into Wisconsin, which showed clinical symptoms of Johne's disease a few months after entry, and became so emaciated at the end of the year that she was considered worthless. She reacted to the johnin test, and showed marked post-mortem lesions of the disease. There is no doubt but that the disease could have been detected in this animal by the johnin test prior to importation.

Once introduced into a country, it spreads imperceptibly: first, because veterinarians are not on the lookout for it; and, second, because of its chronic nature. The efforts which may be made to eradicate Johne's disease in this country in the herds in which it now exists will be lessened in effect if more cases are constantly being imported from abroad.

The disease is not limited to any breed in particular, though it has been reported as occurring so frequently in cattle of the Jersey and Guernsey breeds that the inclination is to consider all other breeds resistant. It has been observed also in Devon, Shorthorn, Hereford, Brown Swiss, and Holstein cattle. We have encountered it more frequently in herds of the Channel Islands cattle than in those of other breeds. Its prevalence depends on opportunity for infection, rather than on the susceptibility of the different breeds.

It seems probable that Johne's disease is widely distributed in the United States. Reports regarding it have been received from twenty-seven States.

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The herds belonging to colleges of agriculture in eight of these States have been, or are, infected. In Wisconsin seventy-six herds have been given consideration since this disease first compelled our attention. The distribution extends to a majority of the counties of our State in which the cattle industry is of any consequence. The following data covers the herds tested since November 1st, 1927, under supervision. In each of these herds the test was applied because clinical cases resembling Johne's disease were present.

Cattle tested since November 1st, 1927	1,373
Herds tested	37
Infected herds	34
Reactors	151
Lesions	99
No lesions	22
Autopsies not available	30

Prevalence of the Disease.

Nothing definite can be said concerning the prevalence of the disease in the various sections in which it is known to exist. It is certain that a very small percentage of the infected herds is known. The only cases which have been recognised are those in herds belonging to especially alert farmers, or cared for by veterinarians who have had the disease in mind as a possible factor in explaining losses from the herd. Meat inspectors, veterinarians, and leaders in live stock sanitation have been largely oblivious of its presence, until it has been brought to their attention by the farmers. This condition should be reversed, and no doubt will be within a short time.

The disease has at present a limited number of sources from which it can spread. These sources are largely the herds of pure-bred cattle, especially those of the Channel Islands breeds. These sources of infection will continually increase, unless agencies are operative to offset the constantly increasing commerce in cattle from such herds. Dr. V. A. Moore (1924) has compared the present position of Johne's disease with that of bovine tuberculosis sixty years ago, and has prophesied that if not controlled it may become a more troublesome scourge for future generations than tuberculosis is for the present generation of cattle owners.

TABLE I—LOSSES FROM JOHNE'S DISEASE IN A NUMBER OF WISCONSIN HERDS.

HERD	NUMBER IN HERD	DURATION OF INFECTION (YEARS)	NUMBER REMOVED BECAUSE OF INFECTION	YEARLY LOSSES (PER CENT.)
1	45	8	30	8.5
2	50	17	41	4.7
3	40	15	20	2.2
4	35	10	22	6.2
5	18	10	22	12.0

There is no need to contemplate extremely drastic measures concerning the disease. It certainly spreads no more rapidly than tuberculosis, and probably less so. The relatively low percentage of bovine tuberculosis in important dairying

districts, such as central and northern Wisconsin, indicates that bovine tuberculosis required many years to become very prevalent. Johne's disease seems to exemplify a condition to which the old adage, " a stitch in time saves nine," may be applied.

Losses Occasioned by the Disease.

The losses which may come to the owner of a herd infected with Johne's disease is a matter quite apart from its regional distribution and its prevalence. Recently Ernest (1927) has reported on a herd of 207 animals from which twenty-seven cows had been removed on account of this disease during eighteen months. After this, a test was made, and nearly one-half of the remainder was found to be infected.

A somewhat similar experience may be cited in Wisconsin: A herd in Dunn County was first tested in 1927. Number of cattle tested, 33; number reacted, eight; all of which showed visible lesions of Johne's disease upon post-mortem examination. Aside from this, there was one aged bull in the herd that was not tested, due to the fact that he was at that time dying with Johne's disease, and was destroyed.

TABLE II—THE EXTENT TO WHICH JOHNE'S DISEASE WAS FOUND IN SOME DANISH HERDS.

HERD	NUMBER OF ANIMALS OVER TWO YEARS OLD	INFECTED (PER CENT.)	NUMBER OF ANIMALS UNDER TWO YEARS OLD	INFECTED (PER CENT.)
1	139	45.3	31	0.0
2	69	37.7	25	0.0
3	67	34.5	26	4.0
4	148	10.8	73	5.5
5	99	10.0	78	10.0
6	291	13.0	77	8.0
7	85	23.5	29	0.0
8	89	9.8	19	0.0

Avian tuberculin was used as the diagnostic agent on herds known to be free from tuberculosis as shown by testing with mammalian tuberculin. No data were presented as to the actual losses encountered in such seriously infected herds.

TABLE III—THE EXTENT TO WHICH JOHNE'S DISEASE WAS FOUND IN SOME GERMAN HERDS.

	FIRST TEST			SECOND TEST	
HERD	NUMBER TESTED	PER CENT. REACTING	INTERVAL (MONTHS)	NUMBER TESTED	PER CENT. REACTING
1	19	36	11	20	25
2	40	12	8	35	25
3	25	28	8	30	46
4	36	11	10	39	17
5	77	22	10	131	19

The next test was applied in April, 1928. Twenty-eight head of cattle were tested with only one reactor. This animal showed visible lesions of the disease upon post-mortem examination. The next test was applied the following November, when 50 per cent of the herd reacted, and it was feared that some error might have been made in making the test. These reacting cattle were placed

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in isolation until the following May and re-tested, all giving positive reactions. All post-mortem examinations showed visible lesions of the disease.

Bruggé and Cordsen (1908) describe a herd of approximately 120 milk cows, besides the young animals, from which 110 head had been lost in fifteen years.

The period of incubation of Johne's disease is unbelievably extended in some cases. From observations made in England it seems that at least six months must elapse after invasion before symptoms become evident. This implies that the disease is not frequently noted in young animals, a fact which is evident from the data of Table II. The lack of symptoms in young animals does not mean, however, that such may not be infected. Ernest (1927), in testing a herd of 207 animals with johnin, found nearly one-half of the animals responding to the test. Among those giving positive reactions were seventeen calves ranging from three weeks to six months of age. No post-mortem data are available on the young animals. Statements are frequently met which indicate that symptoms in young animals are exceedingly rare, as, for example, Edwards (1926) states that the infection is nearly always noted in adult cattle over two years old, probably due to the long period of incubation.

It is known that animals may harbour the infection for years and yet show no symptoms of the disease. Krautstrunk (1918) describes an animal which had been kept five years after reacting to the test for Johne's disease without showing clinical symptoms. Soon after calving the animal failed rapidly. A six-year-old cow developed Johne's disease from which she died three to four months later. At six months of age this animal had been purchased from a herd in which the disease was known to exist. As far as could be determined, this was the only contact with Johne's disease this animal had ever had. There is in the case of Johne's disease, as in tuberculosis, a tendency for the rapid progress of the disease in some animals which have not previously shown symptoms thereof. Such decline frequently follows parturition. Wilkins (1926) states that affected animals may remain apparently healthy for at least two years, and some may never become visibly ill though suffering from the disease, a fact which must be taken into consideration in any effort to eliminate the disease by removal of animals showing clinical symptoms thereof.

O. Bang (1914) followed the history of fifty-four animals which had reacted to avian tuberculin. Five years later eleven such animals were still apparently in perfect health. During the five-year period, forty-three animals had either been killed or had died; over one-half of these had never shown any physical symptoms. On post-mortem examination the supposedly causal organism was found microscopically in 86 per cent. of the forty-three examined.

Johne's disease is probably one of the most chronic of all of those caused by bacteria. An animal may show unmistakable symptoms of the disease and remain alive for a number of years, exhibiting neither marked improvement nor

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decline. One of the animals under observation by us showed, in April, 1925, what were then considered symptoms of a rather advanced case of the disease. There was little change during the subsequent two and one-half years. Positive reactions to johnin were obtained a number of times during the period. The animals died in November, 1927. Typical lesions were found, and acid-fast bacilli were demonstrated in the affected tissues.

The most striking symptom is the gradual loss of flesh. This may continue until the animal becomes a mere skeleton. The eyes remain bright, but become sunken, due to absence of intra-orbital fat. The muzzle remains moist. Commonly there is no fever, and the appetite is not impaired. These conditions are very similar to those frequently noted in tuberculosis; the latter, being the more common disease, is likely to be the one thought to be present in the herd, and even non-reaction to tuberculin does not always relieve the suspicion of tuberculosis. The other marked symptom is diarrhœa, which appears and disappears, to appear again sooner or later. Diarrhœa is not always a constant symptom of the disease, since well advanced cases sometimes show no evidence of this trouble. Some authors speak of the disagreeable odour of the fæces during the period of diarrhœa; still other authors state that no disagreeable odour was noted.

The most that can be said for the symptoms of Johne's disease is that marked emaciation and intermittent diarrhœa should arouse the suspicion of the owner. Non-reaction to tuberculin increases the probability of Johne's disease being present. The final answer can be obtained only through a post-mortem examination, or through the use of the specific diagnostic agent, johnin. The exceedingly slow development of the disease, and its ebb and flow in the animal are likely to lead to the conclusion that some physiological disturbance is the cause of the condition, rather than the presence of an infectious disease. This lack of recognition of the nature of the trouble frequently gives opportunity for widespread infection of the herd.

The characteristic lesions occur in the intestine, the wall of which is thickened over a greater or smaller area. In cases of long standing there is a thickening of the jejuno-ileum extending twenty or more feet. Cases are reported of a thickening of the entire intestinal tract. Such a marked involvement is rare. Inflammation of the ileo-cæcal valve is frequently observed. At times the valve is greatly swollen, becoming fifteen to twenty times its normal size. A piece of thickened bowel presents on its mucous surface a peculiar wrinkled appearance; the mucosa seems to be thrown into folds and ridges. Normal gut at times presents wrinkles which, however, will disappear on stretching. It is not uncommon for a piece of normal bowel to be interposed between two thickened pieces. This patchy tendency is frequently noted in cases in which the cæcum is involved. We have noted nothing characteristic as to the colour of the infected mucosa. Occasionally there may be small petechiæ, irregular in outline and distribution. Twort and Ingram noted a characteristic pinkish-yellow colour. This yellow

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colour does occur, but has not been constantly observed by us. At times the intense inflammation in the region of the valve will impart a dark-red colour.

It is entirely possible that these acute inflammatory changes are due to the secondary invasion with other types of bacteria. Part of the reacting cattle slaughtered by us had never shown symptoms of Johne's disease. In several of these animals the ileo-cæcal valve was markedly enlarged and inflamed. On the other hand, in some cases of long standing, inflammatory changes were slight or entirely absent. We have never observed ulcers or nodules. The macroscopic changes of the lymphatic glands are meagre, and confined to a slight enlargement and softening of the substance. On section, a serous fluid frequently exudes. In one case of long standing, a marked induration was noted.

The tissue destruction, so characteristic of tuberculosis, is lacking in the case of Johne's disease. Frequently the lesions seem to bear no relation whatever to the physical condition of the animal. Indeed, the changes in the intestinal wall, even in advanced cases, may be so slight as to pass undetected at a post-mortem examination unless one has Johne's disease clearly in mind while making such an examination. The lesions will not commonly be found unless the intestine is opened and the internal wall examined. Macroscopic evidence of the disease may be lacking, yet acid-fast bacilli, resembling Johne's bacillus, may be demonstrated microscopically.

There is no evidence to show that an infection is ever overcome. As has been stated, the period between infection and the appearance of symptoms may be many months or years in length. Symptoms may be noted for a period, which may be followed by an interval in which none is evident, and in which the animals gain flesh rapidly. Such has led to reports concerning the value of certain drugs. Sooner or later, however, the parasite begins its onward march, with the battle always ending in its favour, unless some other agency causes death before the parasite has a chance to finish its work. Apparently the same condition prevails in this disease as in tuberculosis, namely, that infection is never overcome by the bovine animal.

As has been stated in the discussion of the pathology of Johne's disease, the necrosis and caseation so evident in tuberculosis are absent. There is, then, no opportunity for the widespread distribution of the organism in the animal through the flooding of the blood stream from an abscess, as occurs in tuberculosis, nor an opportunity for the organism to be eliminated in large quantities, except with fæcal material, as again is true with tuberculosis. Apparently the organism is eliminated only with the material coming from the lesions of the intestinal wall. There is constant desquamation of the epithelium, and probably from the areas in which the organism is growing the desquamation would be more rapid than is normally the case. This would imply that the shedding of the organism would be a steady process rather than an intermittent discharge, as is common in tuberculosis. This would also imply that the fæces would be the only carrier of Johne's bacillus.

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The chronic nature of the disease and the approximate commensal relation of host and parasite undoubtedly mean that the organism may be eliminated over a period of years. The constant contamination of the stable, and hence constant exposure of the animals, may account for the extensive spread of the disease in a herd, in spite of the low infectivity of the causal organism.

Meyer (1914) states that Meissner and Trapp (1910) and Main (1912) have demonstrated that affected animals give off the organism in forty to fifty per cent. of cases. Meyer (1914) claims to have established that the elimination is intermittent. Such observations must be based on microscopic examination of the fæces, a procedure somewhat questionable on account of the minute amount of material which can be examined.

The growth of the organism outside the animal has been considered by Twort and Ingram (1914) as a possibility, since they obtained some growth on media containing an extract of certain seeds. The infection with organisms which have grown in other locations than in an animal is questionable. Some have thought that the disease is most prevalent in cattle pastured on low and marshy lands. The correctness of this belief may well be doubted. From the practical viewpoint it is safe to assume the diseased animal as the chief source of the organism. It seems probable that infection is acquired only by way of the digestive tract. Feeding experiments have given positive results in the hands of a number of investigators. Krautstrunk (1918) thinks infection occurs much less easily than in the case of tuberculosis. It seems from the nature of the two diseases that this is true. In tuberculosis the organism is carried out of the body by the sputum, fæces, milk and urine, and at time in immense numbers. The elimination of Johne's bacillus only in the fæces must certainly have a retarding effect on the spread of the disease as compared with tuberculosis, in which there is opportunity for direct passage of the bacilli from animal to animal by licking each other, and through the soiling of mangers and watering troughs with contaminated material. The body has but one exit for Johne's bacillus, and a number for tubercle bacilli.

Smears made from the intestinal mucosa from cases of Johne's disease reveal the presence of minute acid-fast organisms which cannot be distinguished microscopically from the tubercle bacillus. The mycobacteria, to which both Johne's bacillus and the tubercle bacillus belong, are characterised as a group by the resistance which the stained organisms show toward decolourising agents such as acids and acid alcohol. The resistance is not so marked in saprophytic members of the group as it is in Johne's bacillus and the tubercle bacillus. The action of decolourising agents on Johne's bacillus is scarcely more marked than on mammalian tubercle bacilli, and much less marked than on the avian tubercle bacillus.

The beaded appearance which is often observed in the tubercle bacillus, as well as branching forms, may be found also in Johne's bacillus. The extreme minuteness of the organism has been emphasised by M'Fadyean, Sheather, and

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Edwards (1912), who say it is the smallest known member of the acid-fast group. This will hardly serve, however, to distinguish it from other acid-fast organisms which may be encountered in the animal, and hence no positive statement can be made on the basis of microscopic findings alone, especially where the organisms are not numerous in the tissue. The conditions under which the test is applied should be comparable to those observed in making the tuberculin test. Since the rise in temperature in a positive reaction may not, on the average, be so marked as in the tuberculin test, it is important to avoid conditions that shall affect the temperature of the animals. It seems especially important to avoid the injection of those which show an abnormally high temperature (103° F.). If such temperatures are noted in any considerable portion of the herd on taking the preliminary temperatures, it seems wise to defer the test, since the condition responsible for the fever in some may cause, at some time during the test, a fever in animals which at the beginning showed a normal temperature. O. Bang (1914) believes that when the preliminary temperature does not exceed 102.2° F., a rise to 103.6° F. may be considered as a positive response.

It seems clear that the thermal reaction will appear more quickly following the intravenous injection than following the subcutaneous. However, so little is known regarding the matter that it seems wise to begin the post-injection temperatures within one hour after injection, either intravenous or subcutaneous, and to continue preferably to the eighteenth hour. If the temperature shows no tendency to rise up to the tenth hour after injection, the probability for a reaction is slight.

TABLE IV—HOUR AT WHICH MAXIMUM TEMPERATURE WAS REACHED AFTER INJECTION OF JOHNIN INTO DISEASED ANIMAL.

HOURS AFTER INJECTION	NUMBER REACTED	PER CENT.	HOURS AFTER INJECTION	NUMBER REACTED	PER CENT.
1	0	0.0	7	18	22.7
2	0	0.0	8	4	5.5
3	8	10.12	9	1	1.16
4	5	6.32	10	3	3.70
5	34	43.0	11	1	1.16
6	5	6.32	12	0	0.0

It will be seen from the data in Table IV that approximately 80 per cent. of the highest temperatures fell between the fifth and eighth hours. The increase in temperature following the injection of johnin is presented in Table V.

TABLE V—PERCENTAGE DISTRIBUTION OF REACTING ANIMALS ACCORDING TO MAXIMUM TEMPERATURE ATTAINED ON INJECTION OF JOHNIN.

MAXIMUM TEMPERATURE	NUMBER	PER CENT.
103–104° F.	26	31.3
104–105° F.	35	42.1
105–106° F.	11	13.2
106–107° F.	8	9.6
107–108° F.	3	3.6

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These data were obtained from johnin of a low degree of potency compared with that now available if the amount of cells per unit volume of the medium is a criterion of potency. A more potent johnin might have some effect in increasing the thermal rise. Ernest (1927), employing a johnin which should have been more potent than that used in most of our work, with 5 c.c. injected intravenously, obtained a majority of the maximum temperatures within three to six hours following injection. The temperature rise was approximately the same as in a reaction to tuberculin, both in extent and duration. Among the objections raised to johnin by O. Bang (1914) was the lack of knowledge concerning its effect on healthy animals. We believe our results have shown that this objection is without foundation.

There are manifestations of sensitisation following the administration of johnin other than a rise in temperature. The majority of infected cattle exhibit a roughened hair coat from thirty minutes to four hours following the intravenous injection. The condition is more noticeable in some cattle than in others. We have never seen a roughened hair coat that was not accompanied by a thermal reaction, and that did not correspond approximately in time of appearance with the initial rise in temperature.

At any time between four and twenty-four hours following the administration of johnin, approximately 25 per cent. of infected cattle exhibit a marked softening of the fæces. At times a severe diarrhœa is noted, the bowel discharge being thin and watery, and rarely streaked with blood. A foul odour is sometimes to be noted.

Sometimes an uneasiness accompanied by muscular tremors and more or less dyspnœa may be seen. These symptoms usually appear fifteen to thirty minutes after injection, and persist for from one to two hours.

A peculiarity of the johnin test was noted when some cattle having the disease reacted physically without giving a rise in temperature. Such a reaction may be manifested by a chill, either slight or severe. At other times it is evidenced by a depression which may start within an hour after the injection of johnin, or it may not appear until several hours later, when the cow will merely hang her head with her ears hanging low, eyes partly closed and dull, with no rise in temperature or other manifestation of a reaction. Such cattle, if condemned and slaughtered, usually show lesions of Johne's disease. In these cases it is very seldom we find a rise in temperature, but if retested a few months later they most invariably give a marked rise in temperature, and when slaughtered show advanced lesions of Johne's disease.

In three cases out of approximately 1,000 cattle tested, severe constitutional reactions were noted. The first case was an adult cow that had shown clinical symptoms of Johne's disease for about two months. About one minute after the intravenous injection of johnin she fell prostrate, and remained in an unconscious condition for several minutes; temperature was 102.6° F. The highest pre-

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injection temperature was 101.2°. The pulse was not perceptible. In about one and one-half hours recovery had apparently taken place. She reacted at this time. Post-mortem examination revealed infection with Johne's bacillus. The second subject was a three-year-old heifer that had been tested six months before but did not react. About one and one-half hours after injection this heifer fell prostrate ; dyspnœa was marked ; the temperature was 101.2°. The pulse was not perceptible. In about one and one-half hours recovery had apparently take place. She reacted at this time. Post-mortem examination revealed infection with Johne's bacillus.

The third case was that of a six-month-old heifer. About fifteen minutes after injection she was markedly dyspnœic with a pronounced flank breathing, the tongue protruded, and the temperature had risen from 101.8° to 102.6°. In about thirty minutes she was dead. Post-mortem examination revealed marked congestion in about twelve inches of the ileum, situated about two feet from the ileo-cæcal juncture. Acid-fasts were demonstrated microscopically.

Clinical cases seldom gave a thermal reaction, but usually gave a physical reaction, although that may be hardly noticeable, and it would be good judgment to condemn all clinical cases with a history of Johne's disease on physical examination. Another point which appears rather puzzling is the fact that in a number of herds where Johne's disease has been detected with this test, and the herds have been accredited on the state and federal accredited list for tuberculosis, and where for many years there was no history of tuberculosis whatever, tuberculous lesions were reported by the inspector who performed the autopsy. In one accredited herd, where four cattle reacted to johnin, all showed lesions of Johne's disease, and all showed lesions of tuberculosis. In another herd where three cattle reacted to the test, two of the three showed lesions of tuberculosis. In another accredited herd, where four reactors were found, two of them showed lesions of tuberculosis. Ernest (1927) noted constitutional reactions in a number of reacting animals.

The following experience may be related where in a part of the cattle reacting to the johnin test we have had opportunity for confirmation of the results by a re-test. In one herd consisting of eighteen animals ranging in age from two to twelve years, five reactors were found. These reactions were all definite ; the lowest post-injection maximum temperature was 104.2°. This herd was kept intact and retested one year later, with the result that the same animals again gave definite reactions, and in addition a four-year-old cow that had failed to react the year before. In the meantime no clinical cases had developed. The only irregularity in connection with this herd was the fact that one cow gave a suspicious reaction to the first test and failed to react on re-test. Five cows in another herd reacted to the johnin test. On re-test five months later, two gave definite reactions, and one a suspicious reaction. In a portion of the reacting animals opportunity for post-mortem examination has been presented. No

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lesions other than the digestive tract and adjacent lymph glands which could be attributed to this disease have been noted. Our observations are based on twenty-four post-mortem examinations of cattle reacting to the johnin test. Four of this number revealed no macroscopic lesions of the disease; three, a slight enlargement and reddening of the ileo-cæcal valve with no visible intestinal lesions; four, a marked enlargement and reddening of the ileo-cæcal valve with no visible intestinal involvement; two, a marked intestinal thickening with no visible changes in the valve; and seven, marked involvement of both intestine and valve. Four showed a slight involvement of both valve and intestine.

The appearance of a piece of infected gut in Johne's disease is no indication as to the number of acid-fast organisms which can be demonstrated microscopically. They may be numerous in material showing slight lesions, and difficult to demonstrate in a markedly thickened gut. The specific organisms can usually be demonstrated by histologic section, and many times also by smears. In specimens which we have been unable to demonstrate acid-fasts readily by direct examination we have substituted a method of concentration by means of antiformin. The mode of procedure has been as follows: A small piece, not more than ¼ in. square, of the suspected intestine is placed in full strength formaldehyde for from one to two hours, depending on the size of the tissue. It is then removed and placed in the incubator or drying chamber until thoroughly hard and dry. The tissue is then ground to a fine powder in a mortar, and this powder treated for two hours with a 25 per cent. antiformin solution. This is diluted with an equal volume of distilled water and centrifuged. The supernatant liquid is decanted, the tube filled with distilled water and again centrifuged. The sediment is examined for acid fasts. This method has given good results. Acid-fast organisms have been found in the tissues of thirty-six of the thirty-seven reacting animals examined.

The purpose of our interest in this disease was to determine the possibility of eliminating the disease from herds through use of the methods shown to be effective in eradicating tuberculosis. It thus involved the isolation of the causal organism, its continued cultivation, the preparation of the diagnostic agent, and its use in the field. It was recognised that the slow progress of the disease in the invividual animal would undoubtedly make the task of freeing a herd from the disease a long one. Practically nothing was known concerning the length of the period of incubation, nor was anything known concerning the stages of the disease in which an animal may not react to the test. The herd on which the most work has been done was known to have been infected for fourteen years at the time the work was begun. During this period twenty animals had been lost because of the disease. The average number of animals in the herd was forty-five. Table VI presents the results obtained in the various tests made on this herd.

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TABLE VI—RESULTS OF TEST ON HERD I.

DATE	REACTORS
June, 1917	5
November, 1917	4
February, 1919	6
June, 1919	3
November, 1919	4
June, 1920	4
December, 1920	2
June, 1921	0
July, 1923	1
April, 1931	1*

* Animal condemned for physical reasons, but no lesions of Johne's disease were present; neither could the organisms be demonstrated.

The owner of this herd felt very hopeless in his struggle against this disease because of the fact that there was no way of ascertaining which were the infected animals until clinical symptoms appeared. It is probably true that long before these symptoms are to be noted the organisms are being given off by the affected animals. It was hoped that the test would enable the affected animal to be recognised before she became a source of danger to the other members of the herd. It was this hope that led the owner to continue to use the test in his herd. The specific organism has been found in the tissues of all but one of the twenty-eight animals examined. The animal reacting in 1923 was not examined for acid-fast bacilli. In the test made in June, 1919, one adult member gave a suspicious reaction. At the following test in November, 1919, there was no indication of a reaction to the johnin. The animal, however, did give a clear-cut reaction in June, 1920, and was removed from the herd. Another herd has been tested once yearly for three years. One reactor was found in the first test. No animals have reacted during the second and third tests. One clinical case developed in this herd. The infection was demonstrated by post-mortem examination in both the clinical case and the animal reacting to the test.

Field experience with the control and eradication of Johne's disease in individual herds is not very encouraging. Even with the present diagnostic agent, johnin, considered far better than the product which was originally made, it is extremely difficult to eradicate the disease from a herd. Perhaps the test itself is as efficient as one could expect a diagnostic test to be, but the fact remains that with our present test, and with such knowledge as we have relative to the disease, and the procedure to be followed in eliminating it from a herd, we find it extremely difficult, frequently impossible, to rid herds of the disease.

Some have suggested that the johnin test in its present form is not able to pick out all infected animals. Others have offered the explanation that the mode of transmission and the behaviour of the organism are such that even though the johnin test picked the infected animals accurately, the disease germs would still be prevalent on the premises, and later re-infect susceptible animals. Whatever

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the situation is, we feel that our field control efforts in connection with this disease have not been rewarded by a commensurate success. In reviewing our work in connection with this disease on a considerable number of herds, we can look back to only one heavily infected herd in which, at the present time, we have reasonable grounds to feel that the disease may have been eliminated. Even in this case we are not absolutely sure that the disease may not reassert itself again in the future.

Johne's disease is being handled on a basis similar to tuberculosis in respect to indemnity by the federal Bureau of Animal Industry, and by many of the States. At the present time it is not feasible to quarantine a herd and prevent the disposal of animals from a herd infected with Johne's disease, for the reason that no assurance can be given the herd owner that the disease can be eliminated from his herd within a reasonable period of time. Since such assurance cannot be given, the herd owner could not endure the economic loss which necessarily must be experienced if the herd were quarantined for a period of a number of years. As the situation works out practically, herds infected with Johne's disease are not prevented from being disseminated, and as a result the spread of the infection from the various foci continues. It would be desirable to devise some means by which herds having this disease could be placed under quarantine to prevent the dissemination of this disease. Under the present scale of indemnity, it is not possible to do so.

It would be to the interest of future live stock health if some provision could be made to condemn the entire herd where the infection is disclosed in more than a slight degree. Such procedure would be advisable at this time, when the amount of infection is comparatively small. But if we are to go along for a number of years and permit this disease to become more prevalent, then, of course, it will be too late to use such drastic measures. The prompt removal of any animal from a known infected herd is undoubtedly a wise step in limiting the spread of the disease. The use of other means to limit the infection is desirable, even though it is more or less questionable whether doing so will destroy all germs in infective material.

There is little reason to believe that the disease can be introduced into a herd other than through an infected animal. It may be that contact through fences might result in spread. It seems that the disease is much less easily acquired than is tuberculosis, and that the danger sometimes emphasised, in the case of tuberculosis, of infection by limited contact as in cars, stock yards, shows, etc., can scarcely be sufficient to cause any number of infections.

The protection of the herd must be based on the consideration of the animals introduced. Any animal from a diseased herd is a possible danger. Purchasers of breeding cattle should satisfy themselves as to the condition of the herd from which animals are to be acquired. The disease, as far as we are aware, is never considered by purchasers of stock at sales. Cattle are consigned to sales from herds

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known to be infected. With this disease, as with others, the farmer's protection must come from his own efforts, as well as from the live stock sanitary officials. The greater danger at present is associated with the more valuable herds, since most of these have had much more opportunity to become infected than has the average farm herd.

Various problems in relation to this disease require more research study. More definite information relative to the efficacy of the diagnostic agent, johnin, and the response of infected animals to it, is necessary. Likewise, more information is necessary regarding the behaviour of Johne's bacillus within the animal body as well as its outside habitat, and also its relationship to other closely related acid-fast organisms.

Clinical Articles

A Case for Diagnosis.

By F. E. RICKARD, M.R.C.V.S.

THE following case occurred in the practice of Captain H. D. Sparrow, M.R.C.V.S., of Rochford, Essex.

He was called to attend an aged farm mare, the owner complaining it was "off its feed," but otherwise appeared to be in good health. No other symptoms were detected, and the animal was apparently normal, except for the fact that her molar teeth were excessively sharp. They were rasped in the ordinary way, and it may be noted the animal offered no resistance to the procedure. Some tonic powders were prescribed, and instructions given that if rapid improvement did not follow, the veterinary surgeon was to be immediately informed.

The owner neglected these instructions, and when next seen, by chance, a week later, stated the mare was much worse, still refused to eat, and was losing condition. On examination the animal was found to be dull and listless, temperature 103°, pulse 60, and respiration accelerated but normal in character. The eyes, however, presented remarkable lesions. The lids were tumefied, and excessive lachrymation had scalded the face. The cornea was swollen and infiltrated with a straw-coloured, clear, viscid fluid. The lesion appeared to be confined to the lower part of the cornea, and was half-moon shaped, the concavity being superior. Photophobia was marked, and the animal appeared to be in great local pain. No abnormality of the deeper structures could be detected; and the condition not being understood, a simple antiseptic anodyne collyrium was prescribed.

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From this point the mare became rapidly worse, and the next day was found slowly pacing her box in circles. Muscular inco-ordination soon followed, and a tentative diagnosis of some nervous affection was made. Within a few hours the mare was down and unable to rise, but, with the exception of the eyes, appeared to be in no pain. A profound coma rapidly supervened, and the animal was destroyed by severing the large vessels of the neck, thus avoiding injury to the brain. The mare was perfectly oblivious to the procedure.

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Post-mortem examination revealed a twist of the pelvic flexure of the double colon. It may be stated that there was no doubt of the fact that the twist had occurred a considerable time before death, in view of the extensive changes that had taken place in the bowel. One may also say that, definitely, on no occasion did the animal show any symptom of abdominal pain. A detailed examination of the head, including the brain, was made, but no macroscopic lesion could be detected. The eyes were submitted to an oculist, who, however, withheld any opinion.

The owner had at the outset suggested that the animal had been injured by the rasping of its teeth, but the mouth, on post-mortem, showed not the slightest abrasion or other injury. The twist of the bowel was of course independent of the rest of the case, but is remarkable in view of the complete absence of typical symptoms.

Little mention has been made of treatment, but symptomatic treatment was adopted throughout, though it appeared not to have the slightest influence on the course of the disease.

It has been suggested that some microscopic lesion, probably in the cerebellar region, might have existed, resulting in both muscular inco-ordination and irregular peristalsis, leading to torsion of the bowel. This, of course, does not account for the absence of symptoms. It should also be noted that there was no evidence to suggest traumatic injury to the eyes, such as fresh lime-wash, threshing or chaff-cutting, etc.

A Case of Melanosis in a Fowl.

By H. P. HAMILTON, B.V.Sc.(Toronto),
Poultry Pathological Research Laboratory, Goring.

THE subject of this note was an Old English Game hen, aged three years, which at the time of death was in an emaciated condition, weighing only 2 lb. 6 oz.

The letter of advice which accompanied the bird stated that the owner had bred Game for over 50 years, and that during the last 21 years he had from time to time been experiencing heavy losses. Occasionally he "loses chicks

wholesale" from about ten days, and "others never recover properly and do not thrive." The hen sent had been gradually "falling away" for twelve months, and had throughout exhibited very marked stiffness in walking. Appetite had been small, but the bird had continued to eat until nearly the end. She was one of a brood of 13 that became ill when about two to three months of age. Five died, and those that recovered were undersized.

On opening the carcase it was found that the stomach, gizzard, small intestines and cæca were covered with small black tumours (melanomata), varying in size from that of a pin's head to a pea-nut. The heart was also affected. The ovary was inactive, and had become converted into a mass of melanotic tissue.

In view of the history regarding stiffness in gait, we may say that a careful examination of the muscular and nervous systems and bones of the legs revealed no abnormality.

The condition is a rare one in fowls in the experience of the writer, who has not previously met with a case, although we have post-mortemed many thousands of fowls during the last seven years.

The owner was communicated with and asked to supply further particulars, together with any ailing bird for observation and post-mortem examination, but I regret that we were unable to obtain any reply to our request. It is very improbable that the losses to which he refers can be due to melanosis, but we should have been glad to have had the opportunity to examine one or two of his ailing birds to settle definitely that point.

I am indebted to Mr. A. A. Mackay, Assistant-in-Charge of the Serological Research Department of this Laboratory, for the photograph illustrating the condition.

A Case of Intussusception of the Cæcum.

By J. McCUNN.

Royal Veterinary College.

THE patient was a cart horse, which found its way to the knacker yard following an attack of colic. I am indebted to Mr. Tomlin, of Messrs. Harrison & Barbers, for the specimen. I have been unable to ascertain the previous history of the case other than that it was diagnosed as "twist." The specimen shows a complete invagination of the cæcum into the first portion of the colon.

The two photographs show: (1) The condition before opening the colon; (2) the opened colon with the cæcum inside.

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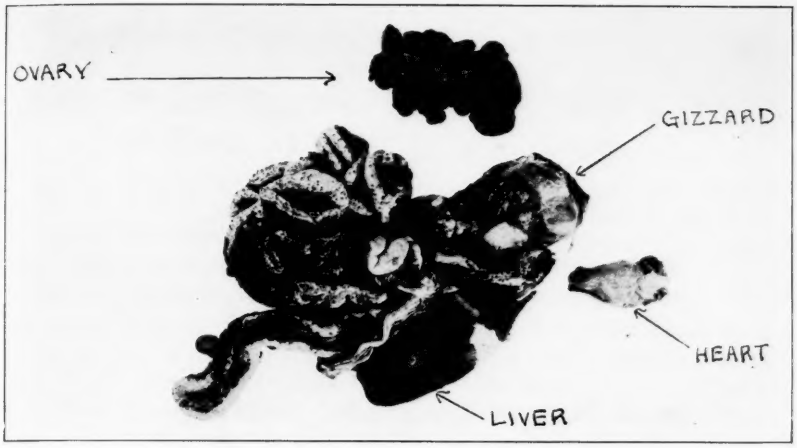

Ovary, heart and intestinal organs of a fowl affected with melanosis.
(*Page* 392)

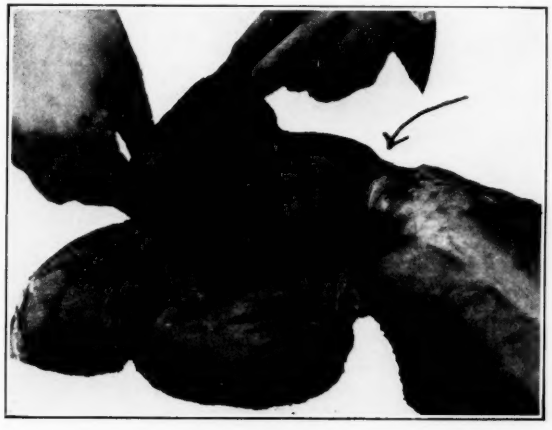

FIG. 1. (*Page* 392)

FIG. 2. (*Page* 392)

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BRITISH PRACTITIONERS AND STUDENTS VISIT ALFORT VETERINARY SCHOOL.

On Saturday evening, July 23rd, the fifth of the series of Veterinary Journal Tours, promulgated to promote good fellowship between our foreign colleagues and ourselves, very successfully demonstrated this principle by visiting one of the oldest and most celebrated of all veterinary schools, that of Alfort. The party, which was under the leadership of Principal Hobday, consisted of Professors Wooldridge and McCunn, Miss Cust, Major Dalling, Messrs. Bushman, Christopher, McDowall, Dykes, Rex Willett, Maguire, Tomlin, Runciman, Farzand Ali (all M.R.C.V.S.), Mr. Powell (on the staff of Major Maule, the architect for the new buildings of the Royal Veterinary College) and Mrs. Powell, Mr. Mackay (of the Poultry Pathological Research Laboratory), and Messrs. M. Ali, Peter Sutton (veterinary students). Messrs. R. Bowden and I. Dvash joined the party in Paris.

The trip was purposely arranged with special regard to economy of time (to suit the practitioners of the party) and money (to suit the students), and for these two reasons the departure took place at 8.40 p.m. on Saturday evening, and the trip was timed to terminate in London at 6 a.m. on Tuesday morning. Leaving Victoria, as stated above, at 8.40 p.m., with comfortable time to dine on the train, the party arrived at Newhaven Harbour at 10 o'clock, and after a quiet crossing, reached Dieppe at 2 a.m. The train journey to Paris (Gare St. Lazare) was covered in the scheduled time (5.25 a.m.), and by the well organised help of Mr. Hopkin, of Messrs. Thos. Cook & Sons, the party reached the Hotel Nolan at 6 o'clock.

Whilst some of the party preferred to retire for a further sleep, others, after a refreshing wash, set out in search of an open café for the usual French breakfast, returning later to the hotel, and afterwards restarting for a visit to the Tuilleries, the Louvre Picture Galleries, and some of the public squares and monuments, under the kindly guidance of M. Gustave Choné, the partner of Professor Coquet, the celebrated surgeon who succeeded Professor Cadiot at Alfort. Lunch, at which M. Choné was a guest, was served in the hotel, and a charabanc tour around the chief monuments and sights of Paris was made in the afternoon and early evening, the party returning to the hotel in time for dinner. Special permission was obtained to visit Pasteur's Tomb, the gorgeous simplicity of the last resting place of this great scientist, who did so much for veterinary science, impressing everyone in a way which will never be forgotten.

On the Monday morning (the weather being excellent) a charabanc was at the door at 8.30 a.m., and again transported the party through the boulevards and suburbs of Paris, and along the banks of the Seine, the destination being the Bridge of Charentont, close by which is the world-famed veterinary school.

The Director, Professor Nicolas, was awaiting his guests, and with old-time courtesy, personally conducted the party around the various departments. After inspecting the students' dormitories and refectory, and being introduced to Pro-

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fessor Coquet, who was busily conducting the Poor Out-patient Department, a visit was paid to the Anatomical Department, Dissecting Rooms, Library, and Museum. The latter is universally acclaimed to be the most complete in the world, and the library holds some treasures which are absolutely unique.

It was with difficulty that the party could tear themselves away from this part of the programme, but much had yet to be seen and time had to be considered, as the main object of the visit was to see the newly constructed £20,000 Canine Hospital Department and Kennels,the chief of which, Professor Robin, welcomed the party at the handsome entrance. Here one saw the latest development of an up-to-date modern canine hospital, and realised what is done nowadays to restore to health the sick pets of the household, and also (what is equally important) the opportunity which can be given to the veterinarian to help his human *confrère* by a mutual study of the analogies between human and animal ailments. The party then visited the other departments, being especially interested in the new Poultry Section, under Dr. Lesbouyries, and in some foot-and-mouth experiments which were being carried out in the research institute.

A sumptuous lunch had been prepared at the Jardin d'Acclimations, the table being so arranged that a full view was obtained of a number of zebras, buffaloes, and other wild animals in the garden. The guests of honour were Professors Nicolas, Robin, and Panisset, and their names were toasted with musical honours, the party not breaking up until late in the afternoon. Afterwards the charabanc was again brought into requisition, and the party visited the Abattoir of La Vilette, and by the courtesy of the "controleur," M. Victor Boudouin, the Municipal Fourrière, where all stray dogs are kept before being put to sleep in the lethal chamber. Except for the fact that it is under police control, the Fourrière occupies much the same position in Paris as does the Battersea Dog's Home in London. The same building, however, also acts as a store for motor cars, bicycles (there were over 2,000 there), traps, and all animals (cattle, goats, etc.) which are found ownerless and straying in the streets of Paris. This conglomeration of lost and stolen goods impressed itself very much on the memories of the party. Dinner was then taken at the hotel, and with the aid of a number of taxicabs the station was reached about 8.40. The return passage was somewhat rough, but with this exception, everybody agreed that the fifth VETERINARY JOURNAL trip had been well up to the standard of those which had preceded it.

Abstracts of Current Literature

Research in Southern Rhodesia.—*From the Report of the Director of Veterinary Research* (Llewelyn Bevan, M.R.C.S.).

THE present depression in agriculture has attracted attention to the possibilities of the pastoral industry, the prospects of which appear to be brighter than they have been for some time past. But it has to be admitted that the industry in

this country is in a very backward condition, and not at present in a position to avail itself of improvements in the world's markets should they occur. The total number of cattle in the country after forty years' European occupation is estimated as a little over two million head, that is, about one head to forty acres.

This unfortunate state of affairs is chiefly due to diseases, some of which have swept through the country, decimating our herds, while others have insidiously exacted their toll. It is also an unfortunate fact that of the two million head the majority are too small and too slow to mature to find a permanent place in the overseas markets, where a regular supply of early maturing animals of uniform type only are required. Great improvement is necessary in our stock before it can hope to compete with animals from other countries.

The sheep industry also is in an equally unfortunate condition, our flocks being so mismanaged and diseased that during the past year it was necessary to import thirty thousand sheep from the south to supply the requirements of local consumption. Pigs, poultry, horses, and dogs are also the victims of known and unknown diseases.

It will thus be seen that in the past the progress of the pastoral industry has been impeded by diseases, and it is probable that its future development will be similarly handicapped unless an exact scientific knowledge is obtained concerning the diseases to which our stock are, or may be, subjected. This can only be acquired by practical observation and scientific research.

A formidable list of diseases is appended, including many which are not understood, and require investigation. But under existing conditions it is impossible to give any one of them the attention it deserves. The time and energy of the two professional officers is monopolised by routine and clerical work, and little remains for research, which requires undivided attention. Nevertheless, every effort is made when possible to investigate the more important local problems, and it may be claimed that in spite of almost overwhelming difficulties some successes have been achieved. For example, the local method of inoculating horses against horse-sickness, of cattle against red water and gall sickness, the antimony treatment of trypanosomiasis, the simplified method of testing for infectious diseases, are the results of original work in this laboratory, and fully justify confidence in local efforts. It is confidently believed that if further research were possible some of the diseases which at present retard the progress of the pastoral industry might be prevented.

Udder Tuberculosis of Cattle. By K. Neiberle. *Archiv. f. Wiss und prakt. Tierheilkunde.* Vol. 61, No. 4.

PATHOLOGICO-ANATOMICALLY three well defined gorms of udder tuberculosis may be distinguished, namely, disseminated miliary tuberculosis, lobular infiltrated tuberculosis, and caseous mastitis.

Disseminated Miliary Tuberculosis arises, like miliary tuberculosis of other organs, in the shape of a generalisation, and above all, as early generalisation.

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Typically miliary tubercles are irregularly distributed on the lower parts of the udder; these caseate early, calcify, and become fibrously encapsulated. The lymph glands of the udder are always involved.

The lobular infiltrated tuberculosis is the most frequent form of udder tuberculosis. In the commencing stage it is often overlooked, or not recognised as such, and designated as a non-specific mastitis; and all the more so as the regionary lymph glands are quite unchanged or not markedly swollen, but without exhibiting apparent tuberculous changes. In the commencing stage in normal lactating udder tissue, small greyish-red, fatty groups, not generally caseating, may be noticed. These lumps consist of large-celled growths in the inter-alveolar tissue, which quickly attack the alveoli and lead to their filling up with tuberculous granulation tissue. The epitheloid growth soon passes on to the milk ducts, and the process advances by the canals formed (not through the blood or lymphatics). Thus large nodules gradually arise which can be plainly seen on section of an affected lobule. In rare cases caseations occur in the infiltrated lobules, which become enlarged, and also tend to tuberculous changes of the lymph glands. As a whole, lobular infiltrated udder tuberculosis must be looked on as a pure productive chronic tuberculosis of a body become possessed with increased disease-resisting power. In opposition thereto is *caseous mastitis*, a prevalent exudative inflammation which is generally not limited to single lobules. The inflamed tissue degenerates and quickly shows coagulation necrosis (caseation), and map-like, yellowish caseous masses arise, in which unbroken islets with greatly distended capillaries may be seen. The lymphatic glands of the udder are always involved in this type of tuberculosis. Caseous mastitis is recognised as an over-susceptibility reaction, and may arise in the shape of the primary infection period, or develop on a downfall of increased resistance from the chronic infiltrating tuberculosis.

Intramuscular Ether Injections in Coughing of the Horse. By Prof. PARDUBSKY, *of Brünn.—Präger Archi. für Tiermedizin und Pathologie.*

COUGHING, as a rule, is a symptom of various affections of the respiratory tract. Not seldom coughing is the first symptom of a serious illness noticed by the owner, and often the only anamnesis, for the practitioner. In a large stud of horses, but especially in a surgical clinic where horses are cast and hobbled, the occurrence of a coughing horse is an undesirable thing. It does not always mean a serious illness. Yet where horses must be cast for operation, I have noticed very severe complications, such as catarrhal influenza, bronchitis, strangles, and pneumonia with lethal exit. In these horses before operation no cough was noticed, but always in such cases they had been in a stall where another horse coughed, and it must be accepted that they were already infected.

Equally undesired is the so-called "spring cough" in racing stables. It is well known that racing has to be declared off because of spring cough in the stables. Clinical experience teaches that the cough is almost regularly spread in an insidious form in a stable, and so a "coughing period" may continue for

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some months in spite of isolation and thorough disinfection. Scarcely are new horses installed but they shortly begin to cough, and eventually fever, loss of appetite, and debility are noticed.

Similarly in large stables one notices an individual horse in which nothing clinically can be determined except painful cough, fever, and debility ; and scarcely is a horse sound, before another begins to cough : until at last we are almost powerless against this coughing. Cough powders, inhalations, injections, etc., seem useless. The above undesirable complications are noticed in human medicine, and post-operative bronchitis, and bronchitis due to chill, etc., occur. Against this post-operative and commencing bronchitis in humans, Bier and Ries (Berlin) recommend the use of intramuscular injections of ether. In order to achieve a slower absorption of the ether, equal parts of ether and olive oil were injected. In the *Zentralblatt f. Chirurgie*, No. 52, 1928, Schneck recommends injection twice daily of 1 c.m. of equal parts of ether sulph. and olive oil twice daily. To avoid pain, he adds 1 per cent. psikain, tutocain, or alypin.

Professor Hemkels, of Hannover, and Bontz, of Crailsheim, have had good success with ether injections in post-operative chloroform bronchitis, and in practice with these injections. The latter gives 96 per cent. of cures.

As a result of these tests, we have tried out this ether therapy in our clinic since autumn, 1926. After two years' observation we can say that the subcutaneous or intramuscular injection of 10 cm. of ether sulph. applied once daily in fresh cases leads almost certainly to a cure in a short time. After the injection one soon notices an improvement in the general condition : temperature drops, and painful cough ceases. The earlier one begins with the injections, the more certain the result. For the injection one can use the ether sulph. as one gets it from the chemist, or mixed with equal parts of olive oil. We inject 10 c.m. of ether sulph. daily, without oil, intramuscularly between the fore-legs. Although we have used these injections in many hundreds of cases, we have never noticed a complication (abscess, etc.). Boug recommends an injection of ether and olive oil in the muscle of the neck, but the danger of rubbing due to itching of the injection place makes us prefer a point between the fore-legs. This plan is used on every horse coming into the veterinary school in Brunn, and I can say that since its adoption no coughing invasions and no complications have been noticed.

On the Nature of the Electric Stunning of Animals. By PROF. DR. MAX MULLER, of Munich. *Deutsche Schlachthof-Zeitung.*

FOR the development of the humane slaughter of animals electric stunning has gained marked significance. To-day the electric method of slaughtering swine is the simplest, cheapest and most suitable. Also for large animals the method is being further developed, and will be referred to later in another connection. A technical advance has already begun, following the finding of Leduc that with certain electric currents the functions of the hemispheres of the brain can be temporarily suspended, so as to cause a humane death of the animal.

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His first communication in the *Zeitschrift für Electrotherapie und Physikal Heilmethoden*, No. 5, 1903, p. 374, had the following words: "The animal lies on its side in a deep sleep, it shows no voluntary movement, does not cry out with pain, or knock about. Apart from a few reflex movements of the hind extremities, the most painful irritations cause no reaction and no defensive or escape movements. This condition can be maintained for several hours. It terminates with the suspension of the current."

Leduc has carried out the procedure on himself twice, with the object of arresting the cerebral functions, and from his experience states that: "Through excitation of the superficial nerves, feeling is at first unpleasant, but quite tolerable. Feeling soon becomes more restful, with a level current. The eye is red; slight contractions of the ocular muscles, of the neck and forearm, and some fibrillar tremors are noticeable. Then one traces a prickling in the finger points and in the hands, which extends to the toes and feet. At first the activity of the speech centre is suspended, and the suspension of the motor centres follow. In this condition it is impossible to react to the most painful irritations, because one is no longer in communication with the experimenters. The limbs are not in complete relaxation, but show no tension. A groan may then be heard, but it is not a manifestation of pain, but is caused through slight excitation of the muscles of the larynx. As the employed current reaches its maximum (35 volts in 4 M.A.), we hear as if in a dream what happens around us; we recognise the impossibility of moving, and of communicating with our colleagues; we feel handling, pinching, and pricks in the forearm, but the sensations are dulled like those in a deeply narcotised limb. It concerns one of the least unpleasant impressions that one can follow the slow phases of cessation and disappearance of faculties. One has the impression of a severe nightmare in which one believes oneself in great danger, but can neither cry nor move. But I had yet sufficient consciousness to discern that my colleagues no longer strengthened the current in order to produce a complete suspension of cerebral activity."

After the first trial a second one was undertaken, in order to study the mode of effect of the current. This time, says Leduc, my colleagues believed that the suspension of cerebral activity would be complete and cease with the current conduction, before a complete disappearance of consciousness and sensibility had occurred. The strength of the current was increased to 35 volts and 4 M.A. In each test Leduc remained 20 minutes under the operation of the current. On suspension of the current an immediate awakening and return of brain functions occurred. The operation caused no unpleasant after-effects. On the contrary, one had the impression of special well-being and physical strength. So far the individual tests of Leduc show the periods of time on his own body that the phases of causing suspension of cerebral activity occupied, although the full end result that Leduc wished for was not attained.

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Leduc has also shown that in animal tests there occur first of all general muscular contractions with opisthotonus; then follows cessation of respiration, weakening of cardiac activity and cyanosis; the symptoms are those recognisable in destruction of the normal functions of the brain and complete loss of sensibility.

For the object of the slaughter of animals a momentary suspension of consciousness is to be accomplished. This is brought about by an increased dose of Leduc's current. The destruction of the function of the brain produces loss of consciousness and feeling, a muscular and blood-vessel contraction, and thus an anæmia of the brain. The symptoms in a stunned animal returning to normal are similar clinically to an epileptoid attack, with loss of consciousness and feeling, as the result of a weak interrupted level electric current on the brain. In electric stunning followed by bleeding, the coma of the unconscious state passes on to bodily death. In bleeding without stunning, on the contrary, a comatose condition comes on gradually, which ends in giddiness and death. In this case the subject must be fettered before being bled, because of the escape movements of the animal, which can be specially noted in young, strong bullocks bled without previous restraint. The violent excitation stage here pictures the fight between life and death in the animal itself. Electrically stunned and in coma, stuck animals show quite a different picture, as a result of the previous destruction of the functions of the cerebrum. A too-small electric stream causes no epileptoid state, but only a soporific condition. Here, with the cessation of the current a state of complete consciousness returns. In animals for slaughter—especially cattle—where the current is slowly applied, they at first become restless and upset, then kneel and lie down, and turn on the side in a somnolent condition, with head turned back, as in milk fever. On further increase of the current, general muscular contractions occur, with episthotonus. The muscles are hard; the flexibility of the limbs arrested; cuticular sensation is absent; the eyelids are closed. With muscular contraction there is at the same time contraction of respiratory muscles, bringing breathing to a standstill; pulse and heart beats are small and weak; as a result of blood-vessel contraction, there is venous stasis. An electrically stunned animal is in a similar state to a man experiencing an attack of great and true epilepsy.

On stopping the current, the tonic muscular spasms are followed by clonic convulsions, which are chiefly limited to the hind extremities; the muscular tissue becomes soft again, and the limbs assume their normal flexibility. Reflex irritability of the skin is lacking. The bulb of the eye—the veins of whose sclera have been cyanotically filled—rotates; breathing starts again, with a deep inspiratory and expiratory sound from passage of air through the larynx. With quiet and regular breathing, the cyanosis of the conjunctivæ disappear; the animal gradually raises its head, rests on its sternum, awake and conscious, and makes quick or slow attempts to rise. When up, it is uncertain on its hind legs,

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but in five to eight minutes it is quite normal. It eats proffered food, and shows no timidity which can be ascribed to any memory of an epileptoid state.

These phenomena show that the application of Leduc's current on the cerebrum brings about a welcome preliminary destruction of the physiological equilibrium between the irritability and conductivity of the processes within the central nervous system. Especially the tonic spastic effect on the muscles and blood-vessels on the introduction of a strong Leduc current shows that the applied irritability on the cerebrum and infracortical centres (trunk ganglia, fornix, medulla oblongata) has encroached so as to hinder the passage of blood to the brain, and the normal physiological activity of the cerebrum is at a standstill. It will be seen then that slaughter by electric stunning and subsequent bleeding is a humane method. We deprive the animal momentarily of consciousness and feeling, without injury to the body and central nervous system, and by bleeding the comatose and senseless body deprive it of life, and produce what we now know as meat or "flesh." The procedure is the mildest, most humane and least objectionable method of killing animals.

Contribution to the Functions of the Yellow Body in the Cow.—*Revue Vétérinaire.* Vol. 78. 3rd Series. Vol. 7.

A GREAT number of clinical observations makes the author believe that the yellow body has an inhibiting action on œstrum; it is the agent of sexual calm which follows heat, persists during gestation, and continues until the following ovulation.

Hypertrophic yellow bodies are the cause of full œstrums, or those longer than normal. In certain cases this exciting influence can go so far as to produce nymphomania. It is difficult to explain these accidental opposing differences of the influence of the yellow body on œstrum—inhibition on the one hand, and exacerbation on the other. A certain number of observations makes one incline to the theory of Prenant, supported by Loeb, which makes the yellow body an inhibitive agent of ovulation, or, better, not by maturation of follicle, but by its rupture. In certain conditions the yellow body seems to inhibit uterine contractions inasmuch as its enucleation brings them about. It is not impossible that the uterine hospitality for the young is due in part to the suppression by the yellow body of the contractility of the womb.

Infectious Laryngo-Tracheitis in Poultry.—Dr. Lerche, *Berl. Tierarzt. Wochensch.* XXXXVIII, 145 (1932).

THIS disease has been reported in America within recent years. Dr. Lerche now reports its occurrence in two districts in Germany. The paper describes the disease as recorded in the American literature, and gives a résumé of the various ideas on its causation and treatment. He describes the symptoms as first a discharge from the eyes of a frothy secretion and a watery or mucous exuda-

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tion from the nasal orifices. Great difficulty in breathing is soon found, and the birds stand with their necks stretched, and their beaks wide open. A distinctive, plaintive, clear sound is emitted on inspiration. Changes in the trachea give rise to a cough-like sound, the feathers become ruffled and dull looking, the animals soon lose strength and die. It is not uncommon, however, to find sudden deaths. Most affected birds die. The disease spreads with great rapidity, and can even infect birds in a distant pen though careful isolation methods are practised. Young birds mostly are affected, especially those from four to eight months of age. Post-mortem examination shows changes only in the respiratory organs. The larynx is much swollen, and shows fine hæmorrhagic spots on the mucous membrane, which is covered with a greyish-yellow exudate. There may also be an easily detachable fibrinous membrane. The tracheal mucous membrane is swollen, dull, and reddish-grey, and also studded with fine hæmorrhages, and covered with exudate. Actual blood may be present in the trachea. Sometimes the whole trachea is filled with exudate, and the disease processes may extend to the larger bronchi. The lungs and air sacs are not usually affected. The author describes at length the histological changes, and reproduces illustrations of the normal and diseased trachea, which demonstrate very clearly the diagnostic features of the disease. He gives at length his ideas on the differential diagnosis between this disease, infectious catarrh, vitamin A deficiency, and fowl diphtheria. Most of his differential diagnosis is based on the differences between the type of exudate in the trachea and larynx, and the histological pictures of the trachea. As to the cause of the disease, several micro-organisms have been implicated, and one author associates with it the presence of spirochætes in the trachea and bronchi. It has been further stated to be simply a special form of fowl diphtheria. Lerche has been unable to confirm any of these findings. In his hands cultural examination of the trachea has revealed the presence of no constant micro-organism which could be held to be the cause of the condition. Lerche found that the subcutaneous or intramuscular injection of the tracheal contents of dead or sick hens failed to set up infection in normal birds. On the contrary, however, small doses of tracheal exudate, injected directly into the trachea of healthy fowls, produced typical symptoms in from three to seven days. From this work it is concluded that the diseases is infectious in nature, and is in all probability caused by a filterable virus. Filtration experiments were not highly successful. Birds injected with the filtrate showed mild symptoms only, the probable explanation being the virus is so large that most of it is held back by the Berkfeld filter. The author also showed experimentally that the disease was distinct from fowl-pox in that fowl-pox virus failed to set up any condition simulating laryngo-tracheitis. Prevention and treatment are dealt with. Ordinary hygienic measures with isolation of sick birds can only be carried out with difficulty because of the highly infectious nature of the disease. The author thinks that certain conditions predispose to infection, *e.g.*, damp, rainy weather, draughty houses, etc. Intramuscular injections of tracheal exudate from sick birds was tried as a method of prevention. Only a small number of experiments were done, but the results were

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not entirely satisfactory. No success attended the use of many drugs in attempting to affect cures, till the author thought of using a substance called transpulmin, which is a solution of basic anhydrous quinine and camphor in etherised oil. It has been claimed that this material has been used successfully in diseases of the respiratory tract in human and veterinary medicine : 0.2 c.c. was injected daily for five days. After two injections, improvement was obtained, and by the third day treated birds appeared practically normal. The author now recommends three injections only. The material is distinctly costly, and a cheaper substitute, transporet, was tried. This was found equally effective, and the recommendation now is 0.3 c.c. of this material injected on two occasions with one day between.

Bacteriological Researches on Braxy in Iceland Sheep—Pathology and Vaccination.—N. DUNGAL. *Ann. de l'Inst. Pasteur*, LXVIII, 604, 1932.

BRAXY has been observed in Iceland for two or three centuries. Clinically, the disease is characterised by its suddenness of onset and early death : animals are sick only from two to twelve hours, and then die suddenly. It is very seldom that affected animals recover. Young sheep mostly are affected, especially those from six to twelve months of age, and the disease usually is observed from October to December. The post-mortem characters are lesions in the stomach of a hæmorrhagic, ulcerous nature, with œdema of the stomach wall. The disease has been investigated by several workers, the most important of whom was Jensen, who claimed that vibrion septique was the cause. Dungal isolated six strains of an anærobe from cases of braxy in Iceland. Five were from sick animals, and one from a sheep recently dead. The strains were identified as vibrion septique, though in one case *B. perfringens* was isolated. Vaccination against braxy in Iceland has been practised since 1897. Various methods have been adopted, including the use of dried culture plus dried serum, introduction of vibrion septique spores on silk, etc. On the whole the results have been successful, though there has been rather a high mortality directly due to vaccination. Dungal has worked recently with formalised culture of septique, following fairly closely the method described by McEwen. Cultures of vibrion septique are grown for twenty-four hours ; 0.5 c.c. formal is added, and the culture is further incubated for a period of six days. One c.c. of this material showed no reaction in sheep, and sheep injected with 0.5 c.c. are found, when tested with virulent culture injected subcutaneously eight to fourteen days later, to be highly immune. They showed no, or very slight, reaction, while control uninoculated sheep died of typical vibrion septique infection. For field work, 0.5 c.c. is used as a single injection. In 1929, over 4,000 doses were distributed in Iceland, and the figures show that 0.13 per cent. sheep died soon after injection, presumably due to the presence of living organisms in the vaccine, and 0.2 per cent. died from natural braxy, *i.e.*, they were not immune. These results compare very favourably

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with any other type of vaccine used. The results in later years have been practically similar. The author also gives some information on the testing of the potency of this vaccine by the use of laboratory animals—guinea-pigs and mice. Although the results are not clean cut, there is some evidence that these animals acquire immunity after one injection of the vaccine, and so the efficacy can be judged in the laboratory.

Studies in Calfhood Immunisation against Bang's Disease.—A. L. Delez. *Jour. Amer. Vet. Med. Assn.*, LXXI, 239 (1932).

THE author studied the value of vaccination with living *B. abortus* culture in five heifer calves, each calf being injected intravenously during the first month of life with cultures of the organism, which were pathogenic for guinea-pigs. Previous to injection each gave negative agglutination results. Animals were bred when between twelve to fifteen months of age, and agglutination tests were made, using dilutions of serum from 1/20 up to 1/1000. The bull used was bred from an infected cow, and was himself injected intravenously with living cultures when three months old. When service took place his titre was 1/50, although when slaughtered at seventeen months of age no evidence of *B. abortus* infection was found. All five heifers reacted to the agglutination test, and continued to do so over the period of observation. Two of the heifers were, during pregnancy, purposely exposed to artificial infection by being injected intravenously with living cultures of *B. abortus*. Both aborted, but did not transmit infection to a control unvaccinated heifer. Of the three remaining heifers in the group, none of which had been exposed to artificial or natural infection during pregnancy, one aborted, and *B. abortus* was isolated from the fœtus. The remaining two heifers carried their calves to full term, and though the condition of the fœtal membrane suggested *B. abortus* infection, this micro-organism was not demonstrated. All five heifers were subsequently slaughtered, and a thorough examination made. *B. abortus* was not found in the uterus of any heifer, but was isolated from the udders of the three which aborted.

The Control of Tuberculosis in Cattle.—H. Miessner. *Z. Tbk.*, 64, 100–107 (1932).

MIESSNER finds that the clinical examination of cattle once yearly has been insufficient to control tuberculosis. He recommends that an inspection be made at least twice every year. By so doing early cases will be found. He also recommends that tuberculin be used on all animals in a herd, or in at least those to which any suspicion is attached. Newly purchased animals should be subjected to thorough examination before being placed in the herd. This examination should include the use of tuberculin, and if possible, the bacteriological examination of bronchial mucus. In his opinion, the material recovered from the respiratory tract of such animals should be injected into guinea-pigs, for he thinks that

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the guinea-pig biological test is a more certain way of diagnosing the presence of tubercle bacilli in suspected material than its cultivation on artificial media. The author expresses the opinion that we have not yet reached the stage of being able to give a definite opinion on the value of immunisation methods against tuberculosis in cattle. He also feels that the use of serological methods in the control of tuberculosis requires further investigation. In the paper he also deals with the control of tuberculosis in poultry, and recommends the separation of affected birds, and the rigid culling of all fowls reacting to the intradermic wattle test.

News

AMERICAN VETERINARY MEDICAL ASSOCIATION ANNUAL MEETING.

In view of the recent meeting of the National Veterinary Medical Association at Folkestone, it will interest our readers to see the programme of subjects presented to our American colleagues between August 22nd and 26th, at Atlanta City. The importance attached to the clinical demonstrations, and to the sections devoted to the small animals and poultry, might be noted with advantage for serious consideration in future meetings of our own Association in Great Britain. Each of these have been lamentably lacking of late years, and they are subjects of great interest to the practitioner.

Papers.

Section on General Practice.

First Session : Wednesday morning, August 24th, 9 a.m.

(1) The Value of Systemic Alkalinisation in Influenzal Types of Diseases—Dr. R. W. Hixson, Falls City, Neb. (2) Lameness and its Treatment in the Horse—Dr. John Baird, Goldstream Stud, Lexington, Ky. (3) Udder Diseases in Cattle—Dr. D. H. Udall, N.Y. State Veterinary College, Ithaca, N.Y. (4) Salt Sick : Its Cure and Prevention in Cattle—Dr. A. L. Shealy, University of Florida, Gainesville, Fla. (5) The Correlation Between Certain Properties of the Milk and the Type of Inflammation in Acute Mastitis—Drs. R. B. Little and F. S. Jones, Rockefeller Institute for Medical Research, Princeton, N.J.

Second Session : Thursday morning, August 25th, 9 a.m.

(6) Parasites in the Horse—Dr. W. H. Wright, U.S. Bureau of Animal Industry, Washington, D.C. (7) General Practice—Dr. J. M. Sutton, State Veterinarian, Atlanta, Ga. (8) Sterility in Cattle—Dr. W. A. Barnette, Greenwood, S.C. (9) Idiopathic Hæmorrhagic Hepatitis of Swine—Drs. A. H. Quin, Jr., Des Moines, Iowa, and J. D. Shoeman, Dallas Center, Iowa. (10) Pasture Diseases in Sheep—Dr. W. H. Lytle, State Veterinarian, Salem, Ore.

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Section on Sanitary Science and Food Hygiene.

FIRST SESSION: Wednesday morning, August 24th, 9 a.m.

(11) Establishing Accredited Abortion-Free Herds—Dr. C. A. Cary, State Veterinarian, Auburn, Ala. (12) The Relation of the Veterinary Profession to Municipal Meat Inspection—Dr. E. D. King, Jr., Board of Health, Valdosta, Ga. (13) Municipal Dairy Inspection—Dr. W. D. Martin, Albany, Ga. (14) Edward Jenner, the Father of Vaccination—Dr. C. N. McBryde, Bureau of Animal Industry, U.S. Department of Agriculture, Ames, Iowa.

SECOND SESSION: Thursday morning, August 25th, 9 a.m.

(15) Handling of Anthrax—Dr. C. A. Cary, Alabama Polytechnic Institute, Auburn, Ala. (16) Blackleg Aggressin Immunisation—Drs. John Reichel and J. E. Schneider, Mulford Biological Laboratories, Sharp and Dohme, Glenolden, Pa. (17) Swine Sanitation—Dr. H. B. Raffensberger, U.S. Bureau of Animal Industry, Moultrie, Ga.

Section on Small Animals.

FIRST SESSION: Wednesday morning, August 24th, 9 a.m.

(18) Critical Tests of the Efficacy of Single Treatments with Tracheal Brushes in the Mechanical Removal of Lung Worms from Foxes—Drs. K. B. Hanson and Frank G. Ashbrook, Bureau of Biological Survey, U.S. Department of Agriculture, Washington, D.C. (19) Intravenous Medication—Dr. E. J. Frick, Kansas State College, Manhattan, Kan. (20) Black Tongue—Dr. H. Calvin Rea, Charlotte, N.C. (21) Ethical Commercialism—Dr. I. M. Hays, Alabama Polytechnic Institute, Auburn, Ala.

SECOND SESSION: Thursday morning, August 25th, 9 a.m.

(22) The Rabbit and Cavy Industry—Dr. H. Wood Ayres, Oklahoma City, Okla. (23) The Hospitalisation and Care of the Cat—Dr. H. W. Brown, Fort Wayne, Ind. (24) Some Cases of Diabetes in Dogs—Dr. H. J. Milks, N.Y. State Veterinary College, Ithaca, N.Y. (25) Pre- and Post-Operative Care of Small Animals—Dr. C. F. Schlotthauer, Mayo Foundation, Rochester, Minn.

Section on Research.

FIRST SESSION: Wednesday morning, August 24th, 9 a.m.

(26) Further Studies in Bovine Coccidiosis—Dr. I. D. Wilson, Virginia Polytechnic Institute, Blacksburg, Va. (27) Studies on Canine Distemper; III—A Comparison of Natural and Experimental Virus Infections—Dr. A. S. Schlingman, Parke, Davis & Company, Detroit, Mich. (28) Some Observations on the Pathology of Johne's Disease (illustrated)—Dr. E. T. Hallman, Michigan State College, East Lansing, Mich. (29) Further Studies on Brucella Infection in Swine—Drs. H. W. Johnson and I. F. Huddleson, Michigan State Experiment Station, East Lansing, Mich. (30) Studies on Brucella Infection at Meat Packing Plants: (I) Incidence of Infection in Swine Slaughtered at Packing Plants; (II) Incidence of Infection and Exposure in Workers at Packing Plants: (III) The

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Effects of Meat-Preservation Processes on the Viability of *Br. Suis* in Infected Hog Meat—Drs. H. W. Johnson, I. F. Huddleson, and E. E. Hamann, Michigan State Experiment Station, East Lansing, Mich. (31) A Continuation of the Study of the Ætiology of Infectious Diarrhœa (Winter Scours) in Cattle—Drs. F. S. Jones and Ralph B. Little, Rockefeller Institute for Medical Research, Princeton, N.J. (32) Relation of the Alcohol-Milk Test to Pregnancy in Cattle —Dr. C. C. Palmer, University of Delaware, Newark, Bel.

Section on Poultry.

FIRST SESSION: Wednesday morning, August 24th, 9 a.m.

(33) A Preliminary Report on the Study of Poultry Vermifuges—Dr. E. F. Thomas, University of Florida, Gainesville, Fla. (34) So-Called Range Paralysis —Dr. F. D. Patterson, Iowa State College, Ames, Iowa. (35) Some of the Practical Problems of a Poultry Practitioner—Dr. H. J. Seaman, Wauseon, Ohio. (36) Leukæmia, Lymphatic Hyperplasia, and Tumours Associated with Fowl Paralysis—Dr. E. P. Johnson, Virginia Polytechnic Institute, Blacksburg, Va. (37) The Use of Pigeon-Pox Virus as a Cutaneous Vaccine against Fowl-Pox in an Egg-Laying Contest—Dr. M. W. Emmel and F. H. Orr, Jr., Alabama Polytechnic Institute, Auburn, Ala. (38) Disinfection of Avian Fæcal Material— W. L. Mallmann and W. L. Chandler, Michigan State College, East Lansing, Mich.

Section on Research and Section on Poultry.

JOINT SESSION: Thursday morning, August 25th, 9 a.m.

(39) A Liver Function Test in Sheep—Dr. J. N. Shaw, Oregon State Agricultural College, Corvallis, Ore. (40) A Discussion of Some Fundamental Principles and Practices Underlying the Application of the Agglutination Test for Bang's Disease (illustrated)—Drs. C. P. Fitch and C. R. Donham, University of Minnesota, Saint Paul, Minn. (41) Treatment for Mastitis with Ultra-Violet Light, Formalin, Colloidal Carbon and Autogenous Bacterin—Dr. E. M. Gildow, H. C. Hansen and V. A. Cherrington, University of Idaho, Moscow, Idaho. (42) Infections of Fœtuses and Foals—Dr. W. W. Dimock, University of Kentucky, Lexington, Ky. (43) Experiments on Fowl-Pox—Dr. C. L. Martin, University of New Hampshire, Durham, N.H. (44) Further Studies on the Efficiency of Vermifuges in Poultry—Dr. W. L. Bleecker and R. M. Smith, University of Arkansas, Fayetteville, Ark. (45) The Pathogenicity of the "Saprophytic Acid-Fast Bacteria"—Drs. W. A. Hagan and Philip Levine, N.Y. State Veterinary College, Ithaca, N.Y.

Section on Military Medicine.

Thursday morning, August 25th, 9 a.m.

(46) The Practising Veterinarian and His Relationship to the Army—Lt.-Col. D. S. Tamblyn, Chief, Canadian Army Veterinary Service, Kingston, Ont. (47) How Can the Operation of the Army Veterinary Service be Improved in Future Engagements in the Light of Experience of the World War?—Maj. R. A.

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Kelser, V. C., U.S. Army, Medical Centre, Washington, D.C. (48) Reminiscences of the Veterinary Service of the A. E. F.—Dr. L. A. Merillat, Chicago, Ill. (49) Some Lessons of Peace—Dr. N. S. Mayo, Highland Park, Ill. (50) Training Policies for Vetèrinary Reserve Officers—Dr. J. G. Horning, Houston, Tex.

Clinics and Demonstrations.

Friday morning, August 26th, 9.30 a.m.

General Clinics.

DEMONSTRATIONS.

(1) DeLaval Magnetic Combine Milking System—H. L. Lykes, DeLaval representative, and Dr. J. G. Hardenbergh, Walker-Gordon Laboratories, Plainsboro, N.J. (This will consist of a complete unit showing cows in the process of milking, handling of the milk, and the sterilisation.) (2) The Federal Hay Inspection Service and its Relation to the Veterinary Profession. A. D. Harlan, Atlanta, Ga. (Exhibit of different grades of hay and grain.)

Special Clinics.

SECTION I: CATTLE (DEMONSTRATIONS).

(1) Teat Surgery—Dr. C. H. Case, Akron, Ohio. (2) Rumeno-laparotomy—Dr. T. H. Ferguson, Lake Geneva, Wis. (3) Physical Examination of Dairy Cow, including technique of field diagnosis of mastitis.—Dr. D. H. Udall, N.Y. State Veterinary College, Ithaca, N.Y. (4) Passing Stomach Tube in Cow—Dr. T. H. Ferguson, Lake Geneva, Wis. (5) Intradermal Tuberculin Injection—Dr. C. C. VonGremp, Atlanta, Ga. (6) Drawing Blood Sample (Cow)—Dr. C. C. Rife, Atlanta, Ga. (7) Sterility in Cattle, including Drawing Semen from Bull—Drs. W. A. Barnette, Greenwood, S. C., and C. H. Case, Akron, Ohio. (8) Treatment of Metritis with Aid of Dural Block. Dr. W. K. Magill, Chester, S.C.

SECTION II—SWINE (DEMONSTRATIONS).

(1) Autopsies and Diagnoses of Parasitic Diseases—Dr. H. B. Raffensberger, U.S. Bureau of Animal Industry, Moultrie, Ga. (2) Operations for Hernia and Otitis Media.—Dr. W. F. Guard, Ohio State University, Columbus, Ohio. (3) Castration Technique (Knife and Emasculotome)—Dr. W. R. Krill, Ohio State University, Columbus, Ohio. (4) Cæsarean Section (Sow)—Dr. Frank M. Wilson, Mechanicsville, Iowa. (5) Epidural Anæsthesia—Dr. W. R. Krill, Ohio State University, Columbus, Ohio. (6) Use of Stomach Tube in the Pig—Dr. Chris E. Juhl, Osage, Iowa.

SECTION III—SMALL ANIMALS (DEMONSTRATIONS).

(1) Blood Transfusion—Dr. Ashe Lockhart, Kansas City, Mo. (2) Cecectomy—Dr. J. V. Lacroix, Evanston, Ill. (3) Pinioning Operation in Birds—Dr. J. E. Severin, Atlanta, Ga. (4) Bulla-Ossa Operation—Dr. W. F. Guard, Ohio State University, Columbus, Ohio. (5) Enucleation of the Eye—Dr. D. A.

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Eastman, Moline, Ill. (6) Spinal Anæsthesia—Dr. E. J. Frick, Kansas State College, Manhattan, Kan.

SECTION IV—HORSES (DEMONSTRATIONS).

(1) Roaring Operation (Standing Position)—Dr. J. N. Frost, N.Y. State Veterinary College, Ithaca, N.Y. (2) Intraspinal and Intravenous Anæsthesia—Dr. R. R. Dykstra, Kansas State College, Manhattan, Kan. (3) Tail Operations (Setting and Straightening Methods). Dr. John Baird, Goldstream Stud, Lexington, Ky. (4) Restraint in the Horse—Dr. John Salter, Dawson, Ga. (5) Autopsy on the Horse, Demonstrating the Various Species of Parasites—Dr. W. H. Wright, U.S. Bureau of Animal Industry, Washington, D. C. (6) X-Ray Demonstrations in the Horse. Dr. R. L. Humphrey, Middleburg, Va.

SECTION V—POULTRY (DEMONSTRATIONS).

(1) Culling Demonstration: Its Advantages to the Poultry Practitioner—Dr. H. J. Seaman, Wauseon, Ohio. (2) Diagnosis of Intestinal Parasites: Administration of Anthelmintics—Dr. E. F. Thomas, University of Florida, Gainesville, Fla. (3) The Tuberculin Test, Reactions and Demonstration of Tuberculous Lesions—Dr. F. D. Patterson, Iowa State College, Ames, Iowa. (4) Whole-Blood Rapid Agglutination Test for Pullorum Disease—Dr. M. W. Emmel, Alabama Polytechnic Institute, Auburn, Ala.

(Other diagnoses and autopsies showing various lesions associated with infectious and parasitic diseases as available material and time will permit.)

IS THE VETERINARY CURRICULUM BECOMING HARDER ?

OF the 933 freshmen veterinary students registered for the five years 1923–4 to 1927–8, inclusive, approximately 83 per cent. were graduated at the end of four years (classes of 1927 to 1931, inclusive). In the fall of 1928 there were 324 freshmen registered in the thirteen veterinary colleges in the United States and Canada. This represented an increase of about one-third over 1927, the greatest increase for some time. Of these 324 matriculants only 247 were graduated this year. The percentage is 75.6, the lowest in six years. Is the veterinary curriculum becoming more strenuous, or are our veterinary colleges becoming more exacting ? Based on this year's showing, only three out of four veterinary students can expect to be graduated on time. If the same rate of mortality holds next year, we may expect about 263 graduates for the year 1933. As a matter of fact, the number will probably be less, as there were only 270 junior students enrolled the past year. However, this number may be augmented by a few who failed to finish on schedule this year. In any event we are still several years away from the time when the number of graduates will equal the theoretical requirements for the country.—*Journal of American Veterinary Medical Association.*

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LONDON MILK SUPPLY.

DURING the first quarter of the present year 309 samples of milk were taken at London railway stations, 29 of which proved tuberculous. Following upon information sent to the medical officers of health of the counties concerned, 22 cows were found upon inspection to be affected with tuberculosis, and were dealt with under the Tuberculosis Order, 1925. Twenty-two samples were taken from the milk of the cows at 10 institutions belonging to the London County Council, and two samples proved on bacteriological examination to be tubercle-infected. Three cows found to be tuberculous were slaughtered.—*British Medical Journal*, August 20th, 1932.

RABBIT KEEPING.

To most people rabbits are associated with shooting and trapping of a pest that can do endless damage on farm lands, but there is another aspect from which rabbits, bred and managed with care, are regarded as a profitable sideline, or even as a specialised industry. Rabbit keeping of that nature has developed in this country to some extent in recent years, and home production is increasing as well it might, seeing that the imports from other countries amount in value to nearly three-fourths of a million pounds annually. It is no doubt the increasing interest in this industry that has prompted the Ministry of Agriculture to issue a *Bulletin* on Rabbit Keeping, which gives a great deal of useful information on breeds, feeding, preparation for market of carcases or pelts, and exhibiting. The *Bulletin* is obtainable, price 6*d.*, from H.M. Stationery Office.—*National Farmers' Union News Sheet.*

NORTH DAKOTA PLACED ON HONOUR ROLL.

NORTH Dakota was designated a modified accredited area on July 1st, and thereby became the eighth state in the Union, and incidentally the second west of the Mississippi River (Idaho was the first), to be tuberculosis-free. The work of systematically eradicating bovine tuberculosis in North Dakota was started in 1918. Three counties (Foster, Eddy, and Wells) were cleaned up in 1924, and at that time became tuberculosis-free areas. On July 1st of this year the four counties (Billings, Logan, McIntosh, and Sioux) reached the coveted goal, and thereby enabled the entire state to become a tuberculosis-free area. Approximately 2,900,000 tuberculin tests were applied in the process of accreditation. Throughout the entire period two prominent veterinarians directed the work: Dr. W. F. Crewe, State Veterinarian, and Dr. H. H. Cohenour, U.S. Bureau of Animal Industry, inspector-in-charge. The honour roll now reads: North Carolina, Maine, Michigan, Indiana, Wisconsin, Ohio, Idaho, North Dakota.—*Journal of American Veterinary Medical Association.*

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CONTAGIOUS ABORTION REGULATIONS IN U.S.A.

The Pennsylvania Bureau of Animal Industry has just placed in effect a new regulation designed to prevent the further introduction of Bang's disease infection into the Keystone State. Among other things, it is specified that cattle that have not passed a negative blood test for the disease may not enter, except upon specific written permission, and then subject to a quarantine upon entry. This regulation really means something, and is markedly different from the regulations of some states that do not allow the entry of cattle that have reacted positively to the test. In the latter case, cattle that have not been tested at all would appear to be eligible for free entry, other requirements being met.—*Journal of American Veterinary Medical Association*, June, 1932.

Reviews

Neoplasms of Domesticated Animals.—By WILLIAM H. FELDMAN, D.V.M., M.S., *Division of Experimental Surgery and Pathology, the Mayo Foundation, Rochester, Minnesota.* With a Foreword by CHARLES H. MAYO. Philadelphia and London: W. B. Saunders Company. 1932. Pp. 410. Price 30*s*.

In sixteen chapters the author has presented most of the important facts on the occurrence, incidence, characteristics and clinical diagnosis of each type of neoplasm according to Mallory's histogenetic classification. He has devoted two chapters to the transmissible lymphosarcoma of dogs and the embryonal nephroma. Dr. Feldman has overlooked some familiar facts, *e.g.*, the diffuse lipoma of the mesentery of cattle, the myxofibroma of the vaginal submucosa in bitch and cow, the adamantinoma of cattle and dogs, and the high incidence of adenoma of the anal and sebaceous glands of dogs. The relatively common cystic enlargement of the prostate due to hyperplasia of the stroma in aged dogs has been mistaken for neoplasia. Precedence over recent American authors was due to the descriptions of embryonal nephroma by Johne (1887), De Jong (1899), Gorig (1901), and others.

Dr. Feldman has not given sufficiently prolonged and critical consideration to the subject matter of his four chapters on the experimental transmission of cancer and the biology, general characteristics and incidence of neoplasms. More penetrating reading of the work on the Rous sarcoma, *e.g.*, by Murphy, Carrel, Baker and C. H. Andrewes might have induced Dr. Feldman to conclude that there was a distinct probability of the growth-inciting agent being a filtrable virus. There is no survey of the knowledge obtained from studies of the action of therapeutic agents on cancer (*e.g.*, irradiation and lead), of the metabolism of tumours, of Gye and Barnard's work, of immunity to transplantation, and of the work of Lumsden and others on serum antibodies. By accepting Slye's views, without reference to Lynch's conclusions, and by ignoring the work of Murray (1911), the author has presented an unsatisfactory account of the influence of heredity on neoplasia.

No references were found in the subject index to tumours of the testicle, vagina, thymus, pituitary gland, parotid gland and œsophagus, adrenal adenoma, hypernephroma and primary lung neoplasms. The authors' index and bibliographies at

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the end of each chapter omit many references to work of German, French and British veterinary pathologists.

The text does not reach the excellent standard of the 193 photographs and photomicrographs, the majority of which the author has prepared from his own collection. The text does not provide the instructed research worker with a comprehensive and orderly arrangement of facts and conclusions, and thus fails to supply the much-needed veterinary companion to Ewing's valuable work; furthermore, the student requiring a consecutive narrative may be disappointed.

In the first paragraph of his preface, Dr. Feldman has expressed dissatisfaction with the teaching and research on neoplasia "in the various veterinary colleges." Before making such criticisms, which those outside the veterinary profession may misinterpret, Dr. Feldman should have taken especial care to make himself familiar with the work done in the veterinary colleges outside his own country, and to give more careful consideration to the literature on neoplasia in general. In spite of our conclusion that this work has been prepared in haste, we are grateful to the author for placing a very useful monograph at our service. Having welcomed and appreciated the high standard of Dr. Feldman's previous contributions to literature, we are assured of his being well fitted to give us a veterinary companion to "Neoplastic Diseases" by his distinguished fellow-countryman. TOM HARE.

Allgemeine Therapie Innerer Krankheiten. By PROF. DR. HEINRICH JAKOB, *Director of the Medicinal and Forensic Veterinary Clinic of the University of Giessen*. Stuttgart: Ferdinand Enke, 1932. Pp. 219. Price M. 12. Bound, M. 14.

THIS is a German book which covers the whole range of modern therapeutics in a concise and comprehensive way. Its author, Professor Jakob, has had long years of experience in veterinary medicine, and hopes that his book will be very useful to veterinary surgeons and students of veterinary medicine. His opening chapters deal with allopathy, homœopathy, and isopathy, and then he goes on to discuss the value of the natural defences of the body against disease (leucocytosis, lysines, antitoxins, agglutinins, etc.). At page 13 he gives some wise hints as to the importance of correct diagnosis before attempting to treat disease. He has no sympathy with diagnosis at a distance or in the absence of the patient, but stresses the importance of a careful overhaul of an ailing subject. Indications, contra-indications, and derivations in lines of treatment are intelligently and scientifically discussed. Perhaps undue importance is given to the section on bleeding. Principal McCall, in his lectures many years ago, effectively proved that benefit was seldom derivable from this procedure, and the old-time references of the author seem to indicate that it has practically died out as a therapeutic remedy. Subcutaneous and cutaneous irritants, and rational, empiric, expectative, and abortive treatments are described. Perhaps to the modern man the latter parts of the book will be most interesting, for there he will find welcome references to the therapy of dietetics, water, and massage, to electricity, sun and air healing, pharmacotherapy, protein, immuno, hæmo, and autohæmo-therapies, and a valuable section on biologics. It is interesting to note that the Professor touches on a malady which has caused much trouble in our country lately. Under grass tetany of cattle, he describes a disease which is similar to that occurring here, and which he attributes to heavy manuring with nitrates and phosphates, and sudden and not gradual turning out of the cows to grass. The whole book, which is a first edition, is well worthy of perusal.

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Careers for our Sons.—By D. W. Hughes. 6th Edition. A. & C. Black. 5*s*. net.

In this compact volume of 326 pages, Mr. Hughes contrives to set out in detail the attractions of the professions, of the Civil Service, and of Commerce.

Parents will find it a reliable guide to the preparatory entrance conditions in each case, and of the prospects, social and financial. The chapter dealing with the two branches of medicine, human and veterinary, is concise yet full and accurate.

Within a space of three pages allotted to it the attractions of veterinary surgery as a profession are truly set out, due weight being given to the part veterinary science now plays in the maintenance of the national health, and of the still greater service which it is destined to give in the future.

Personal

Captain James McAllan, M.A., B.Sc., M.R.C.V.S.

Capt. James McAllan, who has until recently been the Lecturer on Veterinary Science in the Department of Agriculture of the University of Aberdeen, has been appointed to the position of Chief Veterinary Officer for Northern Ireland. It is a post of importance, and Capt. McAllan's selection is a very popular one, as he has already proved his worth on numerous occasions.

Congratulations to Mr. Robert C. T. Herbert, M.R.C.V.S., of Rochdale, on attaining his eightieth birthday.

Congratulations to Major Dalling, the energetic local secretary of the N.V.M.A. Congress at Folkestone; and to Miss Kathleen Arnold (both of the Beckenham staff), who so ably assisted him in making the arrangements such a huge success. Colonel Simpson, the President, and Mr. Knight, the Secretary of the National Veterinary Medical Association, must have felt pleased at the reward of their labours.

It is characteristic of the revolutionary days in which we now live that when the good wishes of the members present were expressed in a practical manner to Major Dalling and Miss Arnold, *the former received a wrist watch, and the latter a cigarette case.*

Obituary.

By the death of Mr. Frank L. Somerset, M.R.C.V.S., the profession has lost a very respected and popular member. Graduating from the London College in 1890, Mr. Somerset spent a brief period as assistant, and then purchased a practice in Chesterfield. In those days the pit ponies in a coal mining district such as this ran into thousands. Ill health compelled him after some years to relinquish active practice, and at the time of his death he was in retirement at Matlock in Derbyshire.

Publishers' Notices

All communications should be addressed to 7 & 8, Henrietta Street, Covent Garden, London, W.C. 2. Telephone: Temple Bar 4646. Telegrams: "Baillière, Phone, London."

Letters for the Journal, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Copy of advertisements should be in the hands of the publishers—Baillière, Tindall and Cox—not later than the 25th of the month, or if proof is required, not later than the 23rd.

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